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## Chapter 2

### AREAS OF CONTROVERSY AND CONCERN

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The scope of this EIR/EIS has been developed through a public scoping meeting, and consultation with the agency task force assembled to review the Project. As a major project in the San Francisco Bay Area, it is subject to close public scrutiny and rigorous review by regulatory agencies. If successful, the Project would provide substantial benefits and further regional goals related to the Bay Area's port industry and natural resources.

Listed below are the issues identified as a result of the public scoping process. These issues or questions reflect the concerns of the general public and public agencies as expressed in comment letters submitted and verbal comments presented at the scoping meeting and task force meetings. Sections of this EIR/EIS where each issue is discussed are referenced in parentheses.

- Will the Project be successful in restoring tidal marsh and associated habitat? Although other marsh restoration projects have succeeded in the San Francisco Bay Area, this project is larger in scale, located in the management area of Suisun Marsh, and proposes to use dredged materials of varying quality. (sections 6.6, 6.7, and 6.8)
- Will the proposed marsh design succeed in establishing appropriate tidal flows, sediment concentration and deposition rates, and in turn wetlands vegetation? (sections 6.7 and 6.8)
- Will there be detrimental local and regional environmental effects from the Project? For instance, will the importation of dredged materials from the saltier Bay waters increase salinity in the Suisun Marsh? Will contaminants in dredged materials escape into the Sacramento River, the Suisun Marsh, and San Francisco Bay, or enter the food chain? (sections 6.6, 6.7, and 6.8)
- How will the quality of the sediments in the dredged materials be regulated? (Chapter 1 and section 6.6)
- How will the Project affect groundwater and surface water once the dredged materials are in place? Is the groundwater supply adequate for Project purposes? Will pumping of groundwater create subsidence? (section 6.7)
- Will the proposed mitigation measures for the salt marsh harvest mouse succeed? Will there be impacts on other special status species? How long will these species be affected? (section 6.8)
- What economic impacts will the proposed land use changes and the associated General Plan and Zoning amendments have on Collinsville and Solano County? (sections 6.3, 6.4, and 6.17)
- Will there be significant site-specific impacts on cultural resources, recreation and public access, noise, traffic, air quality and visual quality resulting from the Proposed Project? (sections 6.3, 6.9, 6.10, 6.11, 6.12, 6.13, and 6.15.)

The major uncertainties related to the short- and long-term effects of the Proposed Project on the natural environment and the feasibility of restoring tidal wetlands are discussed below.

## **2.1 Feasibility of Tidal Marsh Restoration**

Feasibility of marsh restoration is a combination of physical feasibility, which is related to the design of the marsh and the particular physical characteristics of the restoration site, and biological feasibility (or predictability) of certain ecological values and habitat establishing within the marsh. Biological feasibility tends to be less predictable and easily controlled than physical feasibility, however biological feasibility is greatly dependent on physical factors.

Concerns regarding the feasibility of marsh restoration focus on two issues, both of which are dependent on location within the estuary's environmental gradients:

- The consequences of incomplete or defective restoration, resulting from inadequate or ineffective design, and
- The feasibility of restoration of tidal marsh at this particular site, which differs in certain respects from other marsh restoration sites.

Incomplete or defective restoration could result from a number of inappropriate design and physical factors, such as:

- Overfilling with dredged materials so that tidal channels do not form as predicted;
- Subsidence of dredged materials, causing "drowning" of new marsh;
- A deficiency of acceptable dredged materials resulting in incomplete restoration; and
- Unanticipated erosion of channels or marsh surfaces.

The consequences of incomplete or defective restoration could include the increase in concentration of contaminants from exposed non-cover material and possible increase in the risk of bioaccumulation of contaminants, establishment of inappropriate vegetation types in low or high marsh areas, and the failure to replace ecological values lost through the process.

Marsh restoration using dredged materials has occurred throughout the San Francisco Bay at many locations. The chances of success of the proposed Montezuma Wetlands Project can be evaluated to some extent by evaluating wetlands restoration projects in the Bay Area. The power of this evaluation is limited, however, since few data are available from the eastern Suisun Marsh/Delta area where the Montezuma site is located.

Inadvertent tidal restoration has occurred with unrepaired levee failures in Ideal Marsh in Alameda and White Slough Marsh in Vallejo, resulting in natural sedimentation and channel formation. High quality marsh in these cases has been established after a 20-year period<sup>1</sup>.

Quantitative data are not available regarding the potential rate of sedimentation and marsh development in restored tidal systems in the Suisun Bay/West Delta. However, rapid elevational increase due to sedimentation following levee failure has been observed at Ryer Island, about 8 miles west of the

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<sup>1</sup> Peter Baye, U.S. Army Corps of Engineers, personal communication, August 24, 1994.

Montezuma site, and it has been suggested that the sediment supply of Suisun Bay exceeds that of San Pablo Bay<sup>2</sup>.

Bay Area marsh restoration projects have had varying success. There are inherent site-specific and setting-specific physical and ecological advantages and disadvantages for tidal marsh restoration, and these range from minor to significant. Preeminent among site-specific factors are sediment supply and rate, which may vary significantly among sites. For example, most San Francisco and San Pablo Bay marsh restoration projects are located adjacent to the open bay in sediment-rich, high-energy mudflats, where waves resuspend a vast pool of sediment. This increases the likelihood that sedimentation will raise ground elevations and foster marsh development, provided tidal circulation is fully reestablished and initial ground elevations are below mean high water. In contrast, sedimentation at the Montezuma site would depend on the fluvial sediment discharge of the Sacramento River.

Fronting marsh width is another variable affecting the likelihood of successful marsh restoration in diked baylands, because the marsh may act as a hydraulic barrier to tidal circulation. For example, the Sonoma Baylands site has only a narrow band of fronting tidal marsh on San Pablo Bay, whereas this band becomes progressively wider at Bel Marin Keys and Hamilton, respectively. Fronting tidal marsh is essentially lacking at Montezuma, the only intertidal habitats being along outboard levee slopes which are steep and rocky.

Salinity levels in tidal waters can influence the type of vegetation that establishes, and in turn the habitat types and values that result. Vegetation of the more saline high marshes of San Francisco Bay and San Pablo Bay tends to be more predictable than high marsh vegetation in brackish marshes. For instance, pickleweed, which needs high salinity levels in soils, would be more likely to establish in the high marsh areas of the tidal salt marshes within the Bay itself than in the high marsh areas at the Montezuma site, which is a tidal brackish marsh with lower levels of salinity. This difference could have implications for restoring habitat on the Project site for the salt marsh harvest mouse, which is dependent on pickleweed.

Finally, there are important site- and setting-specific differences in ecological opportunities for restoration benefits. For example, marsh restoration that expands or reconnects existing small or fragmented blocks of high-quality endangered species habitat is of greater benefit than restoring remote sites that are in areas of low-quality habitat.

These specific issues are assessed in this EIR/EIS in sections 6.6, 6.7, and 6.8.

## 2.2 Quality of Sediments in Dredged Materials

An estimated 5,000 to 40,000 tons of at least 65 contaminants are deposited in the San Francisco Bay annually.<sup>3</sup> These contaminants include trace elements such as copper, nickel, silver and zinc, and synthetic organic compounds such as organochlorine pesticides, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). The contaminants originate from numerous industrial, agricultural, natural and domestic activities and reach the estuary through various means, such as river flow, storm drains, discharges from maritime vessels, and disposal of dredged materials. Many persistent contaminants

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2 Brenda Grewell, Dept. of Water Resources, personal communication, August 22, 1997

3 Davis, J.A., A.J. Gunther, B.J. Richardson, J.M. O'Connor, R.B. Spies, E. Wyatt, E. Larson, and E.C. Meiorin, 1991. *Status and Trends Report on Pollutants in the San Francisco Estuary*. Prepared under EPA Cooperative Agreement CE-009496-01 by the San Francisco Bay-Delta Aquatic Habitat Institute.

become bound to particulate matter and accumulate in areas of sediment deposition. Once in the Bay estuary, the fate of these contaminants is determined by a combination of physical, chemical and biological processes.

The processes of dredging and disposing of dredged materials in San Francisco Bay or in non-aquatic environments, such as the Montezuma site, may disturb and re-distribute contaminants that have been buried or otherwise sequestered in the sediments. The concern is that these contaminants, once disturbed, may become available in sediments and water at the site, and exert toxic effects upon biota that come in contact with the contaminants. The behavior of contaminants associated with sediments is difficult to predict, and is influenced by temperature, amount of oxygen available, degree of acidity, sediment organic carbon content, salinity, and biological activity. The specific characteristics of each environment in which sediments are deposited will determine the mobility and toxicity of the contaminants, and in turn, the way in which contaminants can affect organisms.

It is not possible to specifically identify the dredged materials that would be deposited at the Montezuma Project site. The material may come from various dredged sites within the San Francisco Bay estuary. Each dredging project requires a dredging permit, and the quality of sediments is reviewed in each permit application by the SFBRWQCB, EPA, and the Corps. There are sufficient data, however, to identify, in general terms, likely chemical constituents that may be present in dredged sediments from various locations in the Bay. In 1992, the Bay Monitoring Survey, part of the Pilot Regional Monitoring Program (RMP), set up 27 sampling stations throughout the Bay. Results of samples are discussed in section 6.6 of this document and are included in Appendix F. Additionally, two dredging projects that were under environmental review during preparation of the EIR/EIS are presented as representative examples of the range of dredged sediment quality that may be available for wetlands creation.

### **2.3 Screening Criteria for Sediments**

A number of federal guidelines and regulations govern the disposal of dredged material. Testing requirements for ocean disposal of dredged material are defined by 40 CFR 227.6. Implementation guidance is provided by the Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual,<sup>4</sup> also known as the "Green Book," promulgated under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972. For disposal sites in, or potentially affecting, inland waters (such as sites within San Francisco Bay), Section 404 of the Federal Water Pollution Control Act (FWPCA) of 1972 as amended by the Clean Water Act (CWA) of 1977 defines the testing requirements. Draft guidance for suitability decisions for inland water has recently been given in Evaluation of Dredged Material for Discharge in Inland and Near Coastal Waters — Testing Manual (Draft),<sup>5</sup> commonly called the Inland Testing Manual. Essentially, the testing paradigm and evaluation procedures are the same as those of the Green Book, and include water quality impacts, biological toxicity, and bioaccumulation assessments. Determinations of suitability or unsuitability for unconfined aquatic disposal are made on the basis of these tests.

The agencies base their decision regarding what dredged materials can be placed in San Francisco Bay on a set of criteria contained in a Corps Public Notice.<sup>6</sup> In order for sediment to meet the criteria for placement in the San Francisco Bay, it must not exceed mortality rates for organisms in other sediments

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4 COE and EPA 1991

5 EPA/COE 1993

6 U.S. Army Corps of Engineers, San Francisco District, Public Notice 93-2.

used as reference (called "reference sediments"). Because the agencies' decisions are made on a case-by-case basis and are discretionary, the particular sediment testing requirements for each proposed dredging project may vary. Sediments can be unacceptable for several reasons, including toxicity and elevated levels of contaminants. Several types of tests and experiments are usually conducted on all material to be dredged and the results are evaluated by the SFBRWQCB, the Corps and the EPA. Bioassays, one type of experiment, are based on the effects of a sample sediment on live biological specimens to see if the contaminants in the sediments result in the death or malformation of the test organisms. Leaching tests are conducted to determine the potential of a contaminated material to release contaminants into water (i.e., whether the contaminants will dissolve or become soluble). Another set of tests determines which contaminants are present and at what levels. One of the ways the agencies evaluate the dredged materials is to compare testing results for sediment samples taken from the proposed dredging site to materials at a disposal area reference site, such as Alcatraz, in the San Francisco Bay.

These criteria apply only to disposal of dredged materials at aquatic sites such as Alcatraz. There was a need to develop criteria for disposal of dredged materials at upland and diked bayland sites. In 1992, SFBRWQCB published interim sediment screening criteria and testing requirements to be applied to projects using sediments for "wetlands and upland beneficial reuse."<sup>7</sup> The purposes of the publication were to provide a rationale for determining the suitability of dredged materials for upland disposal (e.g., wetlands creation), and to establish dredged sediment testing requirements to determine conformance with specified criteria.

The SFBRWQCB study defined two types of material that could be placed at upland/bayland sites and used for wetlands creation or restoration: *cover* and *non-cover*. These categories of sediment are generally based on the concentration of particular contaminants and the results of bioassays.

- *Cover* sediments are those that would pass leaching and bioassays tests and contain certain contaminants at concentrations less than those specified in the SFBRWQCB's interim screening criteria. Cover material must comply with the SFBRWQCB's criteria for aquatic disposal, as well as interim screening criteria for wetlands and upland disposal. Cover material can be used for disposal in wetlands creation and restoration areas, for levee construction, and for covering non-cover material.
- *Non-cover* sediments are those that pass leaching tests, and have contaminant concentrations that exceed criteria for cover material, but do not exceed criteria for non-cover material. Non-cover material must be covered on the top and sides by a minimum of three feet of cover material or material native to the site.

The interim screening criteria are shown in Table 2-1, and compared to average levels of contaminants in the Bay. These screening criteria have been established to provide consistent guidance for beneficial use of dredged sediment in upland and wetland restoration projects in the Bay Area. These are not regulatory standards for application to specific projects.

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7 Wolfenden, John D. and Michael P. Carlin. 1992. *Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse*, Interim Final, California Environmental Protection Agency and San Francisco Bay Regional Water Quality Control Board. December.

Table 2-1  
Interim Screening Criteria

Constituent	Non-Aquatic Criteria <sup>1</sup>		San Francisco Bay Reference Sediments <sup>2</sup> Average (Range) (ppm)
	Non-Cover (ppm)	Cover (ppm)	
Arsenic (As)	85 - 33	<33	10.1 (5.2 - 20.2)
Cadmium (Cd)	9 - 5	<5	0.22 (0.03 - 0.68)
Chromium (Cr)	300 - 220	<220	88.8 (49.7 - 170.5)
Copper (Cu)	390 - 90	<90	41.8 (8.0 - 94.6)
Lead (Pb)	110 - 50	<50	19.7 (8.0 - 45.4)
Mercury (Hg)	1.3 - 0.35	<0.35	0.271 (0.015 - 0.543)
Nickel (Ni)	200 - 140	<140	84.3 (45.1 - 130.8)
Selenium (Se)	1.4 - 0.7	<0.7	0.47 (0.02 - 1.03)
Silver (Ag)	2.2 - 1.0	<1.0	0.31 (0.01 - 1.11)
Zinc (Zn)	270 - 160	<160	105.2 (50.4 - 221.8)
PCBs	0.4 - 0.05	<0.05	13 (0.3 - 41.2)
Pesticides (Total DDT)	0.1 - 0.003	<0.003	4.59 (ND <sup>3</sup> - 33.9)
PAHs (Total) <sup>a</sup>	35 - 4	<4	4,643 (3 - 7,632)

Notes: a PAHs = polynuclear aromatic hydrocarbons.  
b PAHs (lmw) = low molecular weight.  
c PAHs (hmw) = high molecular weight.

The SFBRWQCB regulates wetland restoration projects, such as Montezuma, on a case-by-case basis, with consideration given to chemical, bioassay, and leachate tests, as well as site-specific factors and the most current toxicological information. In many cases, the federal testing requirements described above for ocean or in-Bay disposal are utilized in the determination of cover and non-cover materials. Permits for beneficial use projects (e.g., wetlands creation projects) are required by both the state Porter-Cologne Water Quality Control Act and the federal Clean Water Act. The permitting process for a wetland restoration project requires approval from an indeterminate number of regulatory agencies depending on the location and wetland characteristics of the project. The SFBRWQCB has the ultimate jurisdiction over the discharge of water from these projects, and in the impacts that placement of dredged materials may have on "state waters" (surface and groundwater).

Sources:

- <sup>1</sup> Wolfenden, John D. and Michael P. Carlin. 1992. Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse, Interim Final, California Environmental Protection Agency and San Francisco Bay Regional Water Quality Control Board. December.
- <sup>2</sup> San Francisco Estuary Institute (SFEI). 1994. San Francisco Estuary Regional Monitoring Program for Trace Substances. 1994 Annual Report.
- <sup>3</sup> ND = not detected.

Note: The reference sediment levels are Bay-wide combined averages and ranges from SFEI.

Further classification of the terms and regulatory requirements for the sediment screening criteria and testing requirements has been provided by SFBRWQCB in a letter to the Corps, included in Volume II, Appendix O.

Wetlands restoration using dredged material that is not suitable for aquatic disposal is a new approach to dredged material management in the San Francisco Bay estuary environment, and data from monitoring other projects in the region are limited. As the results of more detailed project specific testing are published, these data would be compared to the sediment screening criteria and modifications made as appropriate.

## 2.4 Release of Contaminants

The concern over the presence of contaminants in sediments is related to the potential risk the contaminants pose to the biological resources that directly and indirectly come in contact with the sediments. The potential risk is related to the availability of the contaminants to biological resources ("bioavailability"). The effect contaminants associated with the sediments would have on biological resources is strongly influenced by a combination of physical, chemical, and biological factors in the sediments and in the environment.<sup>8</sup> Particular chemical forms of a type of contaminant may be more toxic or more easily absorbed than other chemical forms. Increases in the oxidation potential of the sediments and decreases in the pH (acidity) of the sediments probably have the greatest effect on the availability of inorganic contaminants. Contaminant availability can also be affected by physical and biological processes; these include tidal channel bank erosion, channel incision (downcutting), channel headward growth, root penetration and uptake, and burrowing by invertebrates. While several contaminants of concern are micronutrients and are necessary in small amounts for healthy growth, when present in certain forms in high concentrations, these contaminants can produce toxic and even lethal effects.

Many complex phenomena must be considered when assessing the concerns associated with the use of dredged material in wetland restoration projects. A number of these projects now in place are located in areas where existing sediment contaminants exceed the interim screening criteria. Although this is an indication that wetlands restoration can be feasible in spite of the presence of contaminants in the dredged materials, this fact does not exclude the potential for increased bioavailability and long-term injury to the ecosystem. Potential long-term impacts resulting from release of contaminants into the marsh environment include:

- Impaired reproduction of organisms due to bioaccumulated contaminants;
- Changes in structure of ecological communities within the marsh ecosystem due to species-specific intolerance to contaminants;
- Reduced growth rates of affected organisms;
- Food web contamination caused by bio-magnified contaminants passed through both aquatic and terrestrial food chains; and
- Chronic and additive effects from sublethal levels of contaminants in sediments and the water column that could influence the distribution and densities of shorebird, invertebrate, and fish populations within the marsh environment.

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<sup>8</sup> Tessier and Campbell, 1987, cited in Long and Morgan 1990.

The vulnerability of a tidal marsh to sediment-based contaminants depends on several factors:

- Physical and chemical properties of the contaminants;
- Concentrations of the contaminants;
- Hydrodynamics of the marsh; and
- Properties of the ecosystem that enable it to immobilize contaminants and resist changes that would result in mobilization of contaminants (e.g.; oxidation of sediments, channel bank erosion, channel incision, channel headward growth, root penetration).

Given the large number of endangered and special status fish and wildlife species that may potentially use the restored marsh, the release of contaminants is a major cause for concern, and long-term monitoring would be needed to assess potential effects on biological resources. The Proposed Project includes a monitoring program to provide information regarding sediment quality, water quality and contaminant release. Monitoring methodologies and frequencies have been proposed in the Applicant's Draft Monitoring Plan.<sup>9</sup> These details will be finalized, taking EIR/EIS mitigation measures into account, as part of the permitting process and project approval. An important part of this EIR/EIS has been the identification of contingency measures to be implemented if adverse biological effects appear likely.

The interim screening criteria described above were developed based on existing toxicity data promulgated by the National Oceanographic and Atmospheric Administration (NOAA). The data are nationwide in scope and not specific to the San Francisco Bay region. These data were compared to wetland sediment concentrations typically found in the Bay Area to determine how existing sediment concentrations compare to toxicity values. This comparison was used to establish the screening criteria with consideration given to levels of acceptable environmental risk and concerns presented during a public review of the criteria. Application of these criteria, other testing data, and site-specific factors for restoration projects (such as Montezuma) in determining sediment suitability for cover and non-cover is relatively new in the Bay Area and, as such, has not been proven protective of the established environments. Additionally, the toxicity data used in establishing cover and non-cover contaminant concentration criteria<sup>10</sup> have been revised and updated<sup>11</sup> since the criteria were established. These factors result in concerns that application of these criteria may not provide the necessary protection of endangered and threatened species. For example, the USFWS has identified a possible biological toxicity threshold for sediment mercury concentration for endangered California clapper rails below the interim screening criterion for mercury. Scientific controversy and uncertainty exist for both data and models. These uncertainties exist for all dredged sediment disposal alternatives.

## **2.5 The Montezuma Site**

The Project site is located at the eastern edge of the Suisun Marsh system, a vast marsh supporting a diverse mosaic of plant communities adapted to brackish water. The site is within the primary and secondary management area of the Suisun Marsh designated in BCDC's Suisun Marsh Protection Plan and Solano County's Local Protection Plan. Activities occurring on the site can affect the ecosystem of the adjacent Suisun Marsh and Sacramento River. The site is now managed as grazing land, and includes grassland, wetlands and uplands. The site supports special status species of plants and wildlife, including

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<sup>9</sup> Levine-Fricke 1996

<sup>10</sup> Long and Morgan 1990

<sup>11</sup> Long et al. 1995



the state- and federally listed endangered salt marsh harvest mouse, and the federally listed threatened vernal pool fairy shrimp.

The proposed site for the Montezuma Wetlands Project is located near a critical point in the San Francisco Bay estuary, the historic location of the entrapment zone, the area where the inland flow of saline ocean water moving at the bottom of the estuary mixes with the inflowing fresh water from the Sacramento and San Joaquin rivers. The entrapment zone is one of the most biologically productive areas within the estuary, but it has moved upstream to the lower river channels of the Delta in recent years as a result of drought and increased water diversions. The importance of the biologically productive entrapment zone, and the fact that in years of heavy rainfall it may again be located near Montezuma, presents an opportunity and a cause for concern in a project that would return 1,782 acres to tidal action.<sup>12</sup> The presence of the entrapment zone and variable salinity levels in water could increase the uncertainty for marsh restoration; conversely, the Project could affect biological resources in the entrapment zone, most notably fish.

## 2.6 Impacts of Habitat Conversion

Most of the projects where dredged materials are proposed for use in marsh restoration involve placing these materials in subsided, diked historic baylands to accelerate the restoration of these lands to tidal wetlands. These diked baylands consist of over 80 square miles of diked land that historically were part of the Bay and were either tidal marsh or mudflats. These areas represent the best opportunity for enlarging the Bay and restoring lost natural resource values. However, the seasonal wetlands which have formed on portions of these areas may serve as important habitat for Bay species, particularly for shorebirds and migratory waterfowl. Restoring tidal action on these lands converts these seasonal wetlands to tidal wetlands, although dredged materials can also be used to create seasonal wetlands.

The site is approximately 2,300 acres in size, 1,620 acres of which have been determined to be Section 404 jurisdictional wetlands and other waters, most of which are seasonal in nature. The Project would restore 1,782 acres of the site to tidal wetland with high and low marsh features, and create 48 acres of diked, managed marsh. Much of the existing wetlands at the site are degraded and have been adversely impacted by on-going agricultural use. The functions and values of the existing wetlands are variable and differ in many respects from those of the proposed tidal wetlands.

Resource agencies look for a balance of habitat types and functions in projects that would convert large areas of land from one habitat type to another. In any event, mitigation of habitat losses would be required, either by in-kind replacement or conversion to other habitat types of equivalent or greater value. This issue is evaluated in section 6.8 of this EIR/EIS.

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12 "An Analysis of the Beneficial Uses of Dredged Material at Upland Sites in the San Francisco Estuary," June 1994. San Francisco Bay Conservation and Development Commission.



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## Chapter 3 SUMMARY

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This Environmental Impact Report/Environmental Impact Statement (EIR/EIS) analyzes the potential impacts associated with the proposed use of materials dredged from the San Francisco Bay to restore wetlands in the Suisun Marsh in Solano County. The primary purpose of the EIR/EIS is to provide the public and decision makers with information regarding the environmental consequences of the proposed action, the Montezuma Wetlands Project. This document has been prepared jointly by the U.S. Army Corps of Engineers (Corps) as the federal lead agency, and the Solano County Department of Environmental Management (County) as the local lead agency.

Chapter 1 provided additional background on the project's dual purpose and need—to provide for the commercial disposal of dredged materials while restoring tidal wetlands, and on the discretionary actions that are required for project implementation. Following are summaries of the proposed project and alternatives, including no-action, and the associated environmental consequences.

### 3.1 Summary Description of Proposed Project and Alternatives

#### 3.1.1 Proposed Project

The Project proposes to restore 1,782 acres of tidal wetlands, and create 48 acres of diked managed marsh on the 2,394-acre Montezuma site located in Solano County, adjacent to the Suisun Marsh. The site is now diked grazing land containing uplands and non-tidal wetlands.

Disposal capacity of the Proposed Project is 17 million cubic yards (mcy), which is 3 mcy less than that originally proposed because of lowered fill elevations in the revised design. The Project would restore tidal wetlands by constructing cells, separated by engineered levees, creating tidal channels in and between the cells, and connecting the four phase areas of the project to tidal flows. The Project is proposed to be constructed in four phases to minimize temporary losses of wetlands during construction, and to facilitate engineered placement of the dredged material. The initiation of construction of each new phase would be contingent upon the Project's meeting various engineering and ecological criteria.

Dredged material from the San Francisco Bay would be barged to the site, off-loaded, and placed in the cells until elevations suitable for marsh establishment were reached. The dredged materials from the Bay would include about 80% cover and 20% non-cover sediments which meet screening criteria established by the SFBRWQCB. The Project would also operate a sediment rehandling facility, to be used to dry sediments for both on-site use in levee construction and for off-site sales.

#### 3.1.2 On-Site Alternative 1: Managed Wetlands

Alternative 1 differs from the Proposed Project in that it would create 1,822 acres of managed non-tidal wetlands on the 2,394-acre Montezuma site instead of tidal wetlands. The managed wetlands would be similar in function and configuration to those that now exist at other locations throughout the Suisun Marsh. Vegetation within the restored wetlands would be managed according to four different water regimes or "schedules" (see Appendix C), the goal of each schedule being to promote specific vegetation types, to the benefit of different types of wildlife. The project would require continuing management and maintenance. The managed wetlands would be connected by channels to the Montezuma Slough. Water

flow into the site would be controlled by tide gates, pumps, and seasonal evaporation. Water intakes would be screened to limit fish entrainment.

### **3.1.3 On-Site Alternative 2: Combined Tidal and Managed Wetland**

Alternative 2 is similar to the Proposed Project and Alternative 1, but differs in that it would restore both managed wetlands and tidal wetlands on the 2,394-acre Montezuma site. Tidal wetlands would be restored in Phases II and IV, at the southern part of the site. Managed wetlands would be restored in Phases I and III, at the northern part of the site. Other variations in the configuration of tidal and managed non-tidal wetlands are also possible with this alternative. This alternative would combine the benefits of both tidal and managed wetlands, as well as the associated impacts.

### **3.1.4 Off-Site Alternative 3: The Bel Marin Keys Site**

Alternative 3 is similar in purpose and operational characteristics to the Proposed Project, but it would be located on a different site in a more saline area of the San Francisco Bay estuary. The site is 1,610 acres of diked seasonally wet grasslands and uplands, most of which is used for oat hay production, in Marin County adjacent to San Pablo Bay. Site capacity is 17 million cubic yards of dredged materials. The site would be restored to tidal marsh in four phases. The off-loading facility would be constructed about 3.6 miles off-shore in San Pablo Bay. The design for this alternative would incorporate engineering features similar to those of the Proposed Project, except that the marsh plain elevations would be set at approximately local mean high water (MHW) elevation (+2.0 feet NGVD).

### **3.1.5 Off-Site Alternative 4: The Hamilton Site**

Alternative 4 as conceived for this EIR/EIS is similar in purpose and operational characteristics to the Proposed Project. The 840-acre site in Marin County includes the abandoned airfield of the former Hamilton Air Force Base, and the antenna field to the northeast along the San Pablo Bay shoreline, contiguous with the Alternative 3 Bel Marin Keys site. Once marshland, the site is now diked grasslands and paved areas. No agricultural uses occur on the site. This alternative's capacity is 8.7 mcy of dredged material, assuming a +2-feet NGVD finished elevation that would be appropriate for the initial establishment of low-marsh vegetation. The site would incorporate engineering features like those of the Proposed Project and would be restored to tidal marsh in two phases. The off-loading facility would be constructed about 3.6 miles offshore in San Pablo Bay, in a fashion and location similar to that proposed for the Bel Marin Keys alternative above.

### **3.1.6 The No-Project Alternative**

The No-Project Alternative would result from a decision by the Corps not to issue a permit for the project, because it is not possible to construct a project that would meet the project purpose and need without discharging fill material into Waters of the U.S. With this alternative, wetlands would not be restored at the Montezuma site. The site would continue in existing use, subject to use changes in the future consistent with applicable land use and zoning regulations and policies of the local jurisdictions.

## **3.2 Environmental Consequences of the Proposed Project and Alternatives**

Tables 3-1 through 3-5 summarize the environmental impacts of the Proposed Project and the four project alternatives. Information in the tables has been ordered to correspond with environmental issues described in Chapter 6. An impact summary table for the No-Project alternative is not included because that

July 1998

alternative involves the continuation of existing land uses, which generally results in there being no environmental impacts, although site conditions are subject to change in the future.

The tables list adverse and beneficial impacts and mitigation measures for the Proposed Project and for each of the four project alternatives. They are arranged in four columns:

1. Environmental impacts,
2. Level of significance prior to mitigation,
3. Mitigation measures, and
4. Level of significance after mitigation.

The level of impact significance prior to mitigation is noted in the second and third columns as either "LS" for less than significant, "S" for significant, or "NA" for not applicable (which is explained below). The impact determinations are provided separately for the County and Corps, based on general guidance in the CEQA and NEPA regulations, respectively, as applied by the lead agencies to the particular circumstances of this project. Solano County is the lead agency under CEQA and the Corps is the lead agency under NEPA for this project. The offsite alternatives are not in Solano County, and would be under the control of another local jurisdiction, Marin County for Bel Marin Keys, and the City of Novato for Hamilton. County significance determinations for the offsite alternatives are intended to be generally consistent with those made for the proposed and on-site alternatives, but they do not obligate any decisions or findings by the local jurisdictions that control these sites.

Determinations of significance for the County and Corps differ in many cases, based on the scope of the impact, the degree of regulatory control, and the relationship to state and local versus federal environmental requirements. In several instances, significance thresholds are lower, i.e. more easily exceeded, resulting in a significant impact, for the County than they are for the Corps.

If an impact would not be significant under CEQA but it would be significant under NEPA, the notation for impact significance would read "LS" for the County (under CEQA) and "S" for the Corps (under NEPA).

NEPA and CEQA treat beneficial impacts differently. The level of significance under NEPA (i.e., the Corps) is identified for beneficial impacts. CEQA does not require identification of beneficial impacts; therefore, the level of significance for Solano County, the lead agency under CEQA, is noted as "NA" for not applicable. No mitigation is required for beneficial impacts.

Economic effects are also considered differently under NEPA and CEQA. For economic and fiscal factors associated with the project, impacts are determined to be either adverse or beneficial and then, under NEPA, determined to be significant or less than significant. The significance of economic impacts is not applicable under CEQA, which does not consider economic impacts to be significant. The CEQA Guidelines Section 15131 states, among other things, that the economic or social effects of a project shall not be treated as significant effects on the environment. However, the economic impacts that would occur would primarily affect conditions in Solano County or the Bay Area. Therefore, the impact significance under CEQA, when indicated in the tables as "NA" for the County, refers only to the fact that, under CEQA, economic impacts are not considered significant environmental impacts. If, however, an economic impact has clearly foreseeable environmental consequences, that impact is recognized in this document as appropriate under CEQA.

The level of significance after the indicated mitigation is noted in the last column of the tables. For adverse impacts, the significance after mitigation is either "LS" for less than significant or "SU" for significant

and unavoidable. The significance of beneficial impacts would not change from the original assessment of the impact because no mitigation is required.

For a complete description of potential impacts and recommended mitigation measures, see Chapter 6.

Table 7-2 in Chapter 7 compares the major impacts and benefits of the Proposed Project and alternatives. Major conclusions and recommendations of this EIR/EIS are described in Chapter 8.

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
A. LAND USE				
P-LU-1. The Proposed Project would remove 1,650 acres of grazing land from agricultural use, and would change 245 acres of uplands leased by the hunting club to tidal marsh.	LS	LS	No mitigation required.	LS
Other land use impacts are related to disturbance of surrounding and on-site uses during construction and operation phases of the project. These impacts are identified under the appropriate topic. See Traffic, Circulation and Access; Air Quality; Noise; Recreation; and Utilities sections in this table and in the EIR/EIS.				
B. POLICY				
P-POL-1: The Proposed Project would be inconsistent with Solano County plans and policies for placement of dredged materials in marsh and water-dependent industrial-designated areas, and the rehandling of dredged materials for on-site and off-site use would be inconsistent with uses allowed in the I-WD zoning district.	S	LS	P-POL-1: The Solano County General Plan the LPP, and the zoning ordinance shall be amended to allow for placement of dredged materials for wetland enhancement prior to permit approval. In addition the zoning ordinance shall be amended to allow for rehandling of dredged materials for on-site and off-site use prior to permit approval.	LS
P-POL-2: Project implementation would involve marsh restoration on 541 acres of land designated for future water-dependent industrial use by the County.	LS	LS	No mitigation required.	LS
P-POL-3: Amendment of the Marsh and Wetland Habitat Land Use Proposals of the Land Use & Circulation Element (LUCE), the Resource and Conservation Element (RCOSE), the Subarea Land Use and Transportation Policies for the Wetland Protection and Western Industrial Subareas of the Collinsville Montezuma Hills Area Plan (CMHP), and the Marsh Preservation (MP) District in the Solano County Zoning Ordinance could have indirect impacts on the Suisun Marsh by setting a precedent for allowing disposal of dredged materials in existing wetlands.	LS	LS	No mitigation required.	LS

S = Significant Impact    LS = Less-Than-Significant Impact    SU = Significant Unavoidable Impact    NA = Not Applicable

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
B. POLICY				
P-POL-4: Proposed year-round construction would be inconsistent with Solano County Grading and Erosion Control Ordinance Article 3, Design Principles and Standards, requiring revegetation of the graded areas in advance of the rainy season, between mid-October and mid-April. It would also be inconsistent with the RCOSE requiring that soil disturbance be limited to the period between April 1 and October 1.	LS	LS	No mitigation is required because runoff is controlled within the diked area of the site prior to discharge, and because the grading permit will require adequate erosion and sedimentation controls.	LS
P-POL-5: The Project would contribute significantly to the regional goals for the long-term management of dredged materials in the San Francisco Bay estuary.	NA	S	No mitigation required for a beneficial impact.	NA
P-POL-6: Proposed improvements including additions to the DWR Day Use Area and the Phase IV public access facility would be consistent with Solano County General Plan and BCDC Suisun Marsh Protection Plan and Bay Plan policies and would provide beneficial impacts.	NA	S	No mitigation required for a beneficial impact.	NA
P-POL-7. The proposed placement of relocated utility lines on poles, above ground, is potentially inconsistent with County policies directing that utility lines should be located at least one-half mile from the edge of the Marsh and installed below-ground within the Suisun Marsh unless such installation is more environmentally damaging than above-ground installation, or is economically infeasible	LS	LS	No mitigation required for a beneficial impact.	NA
C. GEOLOGY AND SEISMICITY				
P-GEO-1: Facilities, especially temporary structures, are subject to damage during a future earthquake by strong ground shaking and liquefaction.	S	S	P-GEO-1: Structures shall be sited, anchored and designed to withstand strong ground shaking and deformation resulting from an earthquake on any identified, potentially seismogenic fault at or near the site.	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
C. GEOLOGY AND SEISMICITY				
P-GEO-2: Critical Project structures, such as cell and perimeter levees, and holding pond levees could fail or be damaged during an earthquake, increasing potential for release of contaminants to the environment and delaying marsh restoration.	S	S	<p>P-GEO-2: Critical Project structures, such as levees, shall be designed to the current engineering standards of practice for levee construction , such as those of the Corps (U.S. Army Corps of Engineers 1978, 1980). Records for the design and reconstruction of the distressed levee sections as well as maintenance records shall be maintained by the Applicant for future design and maintenance of Project levees. These records will be used to track on-going levee maintenance and to perform preventative inspection and maintenance of levees prior to the development of problems.</p> <p>Following repairs to any critical levees damaged during an earthquake event, the survey benchmarks that would be installed as part of the elevation control monitoring program shall be re-surveyed to evaluate deformation that may not be discernible by visual observation. This additional surveying is intended to identify levees weakened but not breached by seismic activity.</p>	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
P-GEO-3: Because of underlying compressible materials, the Project has the potential to create mudwaves, which could lead to levee instability, increasing the potential for exposure of non-cover sediments to the environment. Secondly, mud waves could form adjacent to the site, creating a potential navigation hazard in Montezuma Slough.	S	S	<p>P-GEO-3: If mudwaves form, construction shall be stopped until excess pore water pressures dissipate, the mudwave stabilizes, and the extent of surface deformation to levees and to the adjacent slough channel are evaluated by a geotechnical engineer. Levees shall be reinforced or repaired as necessary, and any persistent navigation hazards shall be removed. The rate of sediment placement shall be reduced, based on the recommendations of the geotechnical engineer. Additional preventive measures are as follows.</p> <p>Prior to the placement of any fill on the site, the Project Applicant shall fulfill the following requirements:</p> <ul style="list-style-type: none"> <li>• A baseline hydrographic survey of the Montezuma Slough immediately adjacent to the site shall be conducted before construction begins in Phase I to provide the basis for identifying and correcting any deformation caused by mudwaves.</li> <li>• For non-cover separation and cell levees: surcharge loads shall be kept significantly below foundation material shear strengths (thin lifts, slow rate of loading).</li> <li>• For interphase levees: drainage of foundation shall be facilitated with sand/wick drains if the subdrain system proves ineffective in reducing pore-pressure buildup.</li> <li>• For all types of project levees: settlement of levees shall be monitored in conjunction with the monitoring program proposed for assessing fill elevations in the sediment placement cells and repairs made, as necessary. The levee design will be modified if the results of the proposed geotechnical evaluations indicate that changes are required for levee stability. The rate of sediment placement operations will be reduced to allow for dissipation of pore water pressures.</li> </ul>	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
C. GEOLOGY AND SEISMICITY				
P-GEO-4: If the proposed subdrain system fails, long-term settlement of the constructed marsh plain may lower it below project design elevations.	S	S	P-GEO-4: A supplemental system consisting of either wick drains, additional surcharge points, or well points, or a combination of these shall be developed for use should the proposed subdrain system prove ineffective.	LS
D. SEDIMENT QUALITY				
P-SED-1: Chemical concentrations in sediments used on the site may on a small scale exceed the proposed criteria (based on the SFRWQCB Interim Screening Criteria).	S	S	<p>P-SED-1: The Applicant shall maintain complete records of the sediment sources, their physical and chemical characteristics, and of the disposition of such sediments within the site. If confirmation sampling indicates that sediments placed on the site have exceeded the required cover or non-cover criteria for placement according to the project design, additional sampling of the affected location(s) shall be undertaken immediately to develop a profile that establishes the nature and extent of the exceedence(s). Based on these results, subject to review and approval by the Corps, County, and RWQCB, one of the following alternative measures shall be implemented:</p> <ul style="list-style-type: none"><li>• If the exceedence is relatively isolated, small in magnitude (within the range of normally expected variability), and not expected to have adverse effects under the conditions of its placement, it may be left in place.</li></ul>	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
D. SEDIMENT QUALITY				
P-SED-1 (continued)			<ul style="list-style-type: none"><li>• If the above circumstances do not apply, the sediments of concern shall be removed to an approved location based on their chemical characteristics. Material shall be removed with mechanical grading equipment or portable dredges capable of working in the marsh environment. Subject to agency review and approval, the sediments may be mixed with confirmed clean sediment to reduce concentrations to within acceptable ranges for placement on the site.</li><li>• The need for additional measures such as liming to reduce contaminant mobility, capping with fine sediments, increased depth of burial or horizontal isolation from channels, and increased long-term monitoring shall be considered by the Applicant and regulatory agencies.</li></ul>	
P-SED-2: Evaporation and concentration of water in ponds could result in a gradual buildup of contaminants to harmful concentrations in sediments and pond water.	S	S	P-SED-2: Quarterly sampling and analysis of the pond sediments and water shall be conducted. If contaminant concentrations in the sediments exceed the screening criteria for cover material, the pond shall be closed until sediments can be removed by clamshell dredging and placed as non-cover material in an available noncover sediment placement cell. If contaminant concentrations in the pond sediments exceed the screening criteria for non-cover material, the sediments shall be removed by clamshell dredging for disposal at an appropriate class landfill.	LS
E. HYDROLOGY AND WATER QUALITY				
P-HYDRO-1: If the designed channels are undersized, the tidal range at the upper ends of the slough channels would not provide the expected frequency and inundation of the marsh plain.	LS	LS	No mitigation required.	LS
P-HYDRO-2: The potential for flooding in the area adjacent to the constructed wetlands could be increased.	LS	LS	No mitigation required.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
E. HYDROLOGY AND WATER QUALITY				
P-HYDRO-3: The marsh plain could inadvertently be placed too high. This would prevent the formation of small channels, and the deposition of soft sediment.	S	S	<p><u>P-HYDRO-3a:</u> The design criteria and action threshold should be stated as follows:</p> <p>“No more than 50 percent of the low marsh plain shall be higher than an elevation that is 0.5 foot below local MHW. Ninety-five percent of the low marsh plain shall be below the local MHW. No more than 50 percent of the high marsh plain shall be higher than local MHHW; 95 percent of the high marsh plain shall be lower than an elevation of 0.5 foot above local MHHW. Corrective action shall be taken if these goals are not met.</p> <p><u>P-HYDRO-3b:</u> In order to prevent overfilling, sediment placement shall be pulsed when the sediment elevation is estimated to be within 1 foot of the design elevation for both the noncover layer and the cover layer; i.e., thin lifts of sediment shall be placed into cells, and fill elevation shall be determined for each lift after initial consolidation. Each successive lift shall be thinner, to decrease the margin of error in achieving final design elevations. During placement, the slurry pipeline discharge point shall be moved as required to several locations within each cell to prevent mounding based upon visual observations at the outfall discharge point. Fill elevations shall also be monitored during sediment placement by means of topographic surveying and a network of resistivity probes.</p>	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts		Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
		County	Corps		
E. HYDROLOGY AND WATER QUALITY					
P-HYDRO-3 (continued)				<p>P-HYDRO-3b (continued): The number of resistivity probes installed within each sediment cell shall be related directly to the acreage and depth of the sediment cell and to the percent fines in the placed sediment. The number of grade control resistivity probes shall be increased in non-cover cells to enhance elevation control in those cells. The upper lifts of the non-cover sediments shall be gravity consolidated prior to placement of cover sediments. The sediment placement method has been modified from what was evaluated in the circulated DEIR to reduce the impact of turbulent flow of cover sediment over the placed non- cover sediments (see Sections 4.6.2 and 6.8.2 for further discussion).</p> <p>If monitoring results indicate that fill elevations have exceeded the criteria in Mitigation Measure P-HYDRO-3a, those overfilled areas shall be graded down to design elevations within six months of completion of sediment placement within each cell. Equipment capable of operating in a marsh environment shall be used, in order to avoid dewatering cells and exposing sediment to oxidation. Elevation control measures are described in more detail in Section 4.6.2. Alternatively, where subdrains are present, additional subdrain pumping could be used to reduce elevations to appropriate levels.</p>	
P-HYDRO-4: The large open reaches of water could allow significant waves to form during high tides. These waves could resuspend deposited sediment, and retard the formation of a mature vegetated marsh.		LS	LS	P-HYDRO-4: Although significant wave fetch is not expected to prevent sediment from settling out of suspension and accumulating under normal conditions, marsh vegetation shall be introduced into sediment cells (see P-BIO-2) where the wind fetch exceeds 1000 feet to reduce potential wave action and re-suspension of sediments that could occur under higher flood tides and storm events.	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts		Significance Prior to Mitigation	Mitigation Measures	Significance After Mitigation
E. HYDROLOGY AND WATER QUALITY				
	P-HYDRO-5: Erosion of major channel banks or incision of small first-order and second-order channels into non-cover sediment could expose the non-cover sediment to erosion, releasing contaminated material into the environment.	S		
		S		
	P-HYDRO-5: The tops of the non-cover separation levees shall be constructed of compacted cohesive clays to prevent channels from cutting through them. The interior slopes of noncover separation levees shall be built with 2:1 to 5:1 interior slopes (depending on exposure to wind fetch), rather than just 2:1 as was previously proposed, which geotechnical evaluations indicate is a sufficiently shallow slope to prevent excessive erosion of the levees during sediment placement operations. They would then function as sills to prevent the upstream channel segments from cutting into the non-cover sediment. The formation of first and second order channels shall be assessed and documented on a quarterly basis during the first year following tidal restoration, and annually thereafter. In the unlikely event that channels greater than 2 feet below MHHW develop over non-cover cells, further channel development shall be prevented by placement of straw bales, and/or revegetation.	LS		

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
E. HYDROLOGY AND WATER QUALITY				
P-WQ-1: There may be an increase in the concentration of contaminants in water in the make-up water pond, which, if discharged to the Sacramento River, would violate water quality standards.	S	S	P-WQ-1: If the concentration of any chemical of concern in the make-up water pond exceeds one-half of the Basin Plan standard for deep water discharge, or other standard imposed through the NPDES permit, one or more of the following measures shall be implemented as necessary to ensure that water quality remains in compliance with discharge standards: <ul style="list-style-type: none"><li>• Increase the settling time in the sediment placement cells;</li><li>• Increase the filtering capacity of the geotextile fabrics used in the non-cover cells;</li><li>• Decrease the amount of recycled water used in the water supply system and increase the amount of make-up water to reduce concentrations;</li><li>• Add limestone to maintain dredged sediment slurry pH above 6.5;</li><li>• Add iron chloride or iron sulfate to enhance precipitation;</li><li>• Add flocculating agents to increase settling of clays and fine-grained sediments;</li><li>• Set up and use an alkaline hydroxide treatment system;</li><li>• Set up and use a sulfide treatment system;</li><li>• Set up and use an ion-exchange or carbon treatment system.</li></ul>	LS
P-WQ-2: Salinity increases in make-up pond water leached from sediments could increase salinity in the receiving waters of the Sacramento River and Montezuma Slough; this increase would be quickly dispersed.	LS	LS	No mitigation required.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
<b>E. HYDROLOGY AND WATER QUALITY</b>				
<u>P-WQ-3</u> : Some increase in salinity of the receiving waters of the Sacramento River and Montezuma Slough could be expected from salts leached from dredged materials in the wetland cells.	LS	LS	No mitigation required.	LS
<u>P-WQ-4</u> : The change in circulation and increased tidal prism in the restored wetlands could slightly decrease salinity in the Montezuma Slough.	LS	LS	No mitigation required.	LS
<u>P-GW-1</u> : The Project's withdrawal of shallow groundwater on the site could reduce groundwater supplies for residents east of the site.	S	S	<u>P-GW-1</u> : Prior to receiving Corps §404 and §10 permits and County use permits, the Applicant shall submit the results of pump tests, supported by data from piezometers and neighboring wells confirming that the Project's withdrawal of groundwater will not affect neighboring wells. The Applicant shall also monitor water levels in local supply wells during the start-up and first month of operation of the GWSS. If water levels are reduced in local wells, the Applicant shall implement one or more of the following measures as necessary to avoid reducing water supplies in neighboring wells: reduce the rate of groundwater pumping; increase on-site water storage capacity; modify well locations or the groundwater extraction system; or provide the affected neighbors with alternative water sources.	LS
<u>P-GW-2</u> : The Project could cause localized increases in contaminant concentrations in shallow brackish groundwater on the site, but it is extremely unlikely that the deeper aquifer would be affected	LS	LS	No mitigation required.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
<u>P-BIO-1a</u> : Wildlife could be attracted to sediment placement cells and exposed to potentially harmful levels of contaminants if non-cover material is exposed onsite long enough for plant and/or invertebrate colonization to occur.	S	S	<u>P-BIO-1a</u> : During project implementation, the dimensions and sediment holding capacity of individual non-cover sediment cells shall be designed in conformity with a confirmed source of sediment to ensure that they are filled with cover sediment within six months and restoration initiated, with minimal exposure of non-cover material to wildlife. Plant and wildlife colonization or use of the non-cover disposal cells shall be closely monitored, and the permitted interval during which non-cover material is left exposed shall be shortened as necessary to minimize plant and invertebrate colonization, and potential wildlife exposure to non-cover sediments.	LS
<u>P-BIO-1b</u> : Once dredged materials are in place and plant colonization has begun, plant uptake of, and wildlife exposure to, contaminants derived from non-cover sediments could occur under certain conditions.	S	S	<u>P-BIO-1b</u> : In addition to measures identified in sections 6.6 and 6.7 of the EIR/EIS, non-cover sediment shall not be placed within the diked pickleweed marsh or within other project design elements where management of the hydrologic regime through controlled flooding and evaporation or water drawdown may be necessary to achieve project goals or mitigation requirements as they relate to the salt marsh harvest mouse (SMHM).	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
<u>P-BIO-1c</u> : It is unlikely but possible that plant growth, animal burrowing, or physical processes could make contaminants in non-cover sediments available for plant and animal uptake. The resulting risks of bioaccumulation and toxicity to wildlife are low but potentially significant.	S	S	<u>P-BIO-1c</u> : Remedial steps will be taken if monitoring reveals bioaccumulation of contaminants. Project monitoring shall include sampling of above-ground plant tissues, submerged macrophytes (e.g. <i>Rupia</i> , <i>Potamogeton</i> ), two species of invertebrates, <i>Eogammarus conferviculus</i> and <i>Neomysis mercedis</i> , or other species that are especially appropriate for comparison with regional monitoring data. Samples shall be analyzed to determine if the concentration of any toxic contaminant is significantly higher than background concentrations. In the event that the concentration of any chemical exceeds this threshold, or in the event that plant roots extend into the non-cover material in the low marsh habitat, the following contingency measures shall be implemented as appropriate: (1) further sampling and analysis shall be performed to verify the findings; (2) affected areas shall be delineated via additional sampling; (3) higher trophic level species shall be sampled to determine if chemicals identified in the above-ground plant tissue, submerged macrophyte, or invertebrate analyses are significantly higher than background concentrations, and are moving up the food web and causing adverse impacts to wildlife; (4) if analyses of higher trophic level species indicates an adverse impact, affected areas will shall be remediated in one of the following manners: (a) the area can be isolated with levees, capped with clean sediment, and converted into a diked managed wetland; (b) the area can be treated in place [e.g., bioremediation for polynuclear aromatic hydrocarbons (PAHs)] and either retained as tidal marsh or leveed and converted to diked, managed marsh; (c) the area can be excavated to remove the affected sediment and place it in an open available cell for non-cover, or dispose of it at an appropriate disposal facility. The excavated area shall be filled with clean sediment and restored appropriately.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
<u>P-BIO-2a</u> : Construction of the Proposed Project would result in short-term losses of existing wetland habitats and associated ecological functions and values on the Montezuma site.	S	S	<u>P-BIO-2a</u> : To offset temporary losses of wetland functions and values water management focused on providing interim wetlands enhancement in unfilled project phases shall be incorporated into the Project; Phase II areas shall be managed to provide shorebird and waterfowl habitat, and Phases III and IV shall be managed to provide SMHM habitat. Water management shall consist of operating existing pumps and drainage structures to control the extent and duration of seasonal flooding, and shall start during construction and continue during the period of sediment placement, but shall be terminated prior to construction within that phase.	LS
<u>P-BIO-2b</u> : Construction of the Proposed Project could alter or eliminate vernal pool habitats and affiliated species on the site.	S	S	<u>P-BIO-2b</u> : Prior to Project construction and implementation, the Project Applicant should prepare a detailed plan which shows how construction activities would avoid impacts on vernal pools outside fill areas. The plan must include detailed site drainage and buffer areas. If impacted, the vernal pools should be replaced at a 3:1 ratio (3.6 acres), preferably near the upland boundary of the Project. To protect regional native plant diversity, native vernal pool-affiliated plant species within areas of dredged sediment placement shall be reestablished in appropriate seasonally ponded habitat within the upland buffer area. Reestablishment shall involve seed collection and propagation or individual transplantation of the plant species listed in Table 6.8.3-2. This mitigation measure may be implemented in conjunction with P-BIO-3d.	LS
<u>P-BIO-2c</u> : Using dredged materials that are excessively sandy could slow the establishment of wetland vegetation, which could also increase erosion and reduce the effectiveness of contaminant containment.	S	S	<u>P-BIO-2c</u> : To foster successful plant establishment and limit contaminant mobility, cover sediments placed above non-cover sediments should have a maximum sand content of 15%, while elsewhere on the site, the top 1 foot should include a maximum of 73 percent sand and 6 percent gravel.	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
<u>P-BIO-2d</u> : High marsh, seasonally flooded depressions, and the upland-transition zone could be invaded by pepperweed, reducing habitat values associated with tidal restoration.	S	S	<u>P-BIO-2d</u> : An exotic species control program focused on preventing the establishment of pepperweed in the high marsh and upland transition areas shall be incorporated into the Project. This program should be coupled with the Applicant's proposed experimentation on methods to enhance pickleweed establishment and growth in high marsh, seasonally wet depressions, managed fluvial hollows, diked marsh, and at the lower edge of the upland transition zone. These measures shall begin during construction and continue for the first three years of tidal restoration in each phase. To demonstrate the viability of habitat restoration, implementation of Phase II shall proceed only after the relative dominance of desirable hydrophytic vegetation in the initial colonization of Phase I landscape elements has been documented.	LS
<u>P-BIO-2e</u> : The attainment of restoration and mitigation objectives is uncertain without the development and implementation of a comprehensive monitoring plan that includes monitoring, reporting, and verification procedures, performance criteria, and contingencies.	S	S	<u>P-BIO-2e</u> : A comprehensive monitoring plan shall be finalized with the approval of permitting agencies prior to project implementation. The monitoring plan shall include the methodology by which physical, chemical, and biological parameters shall be measured to establish the attainment of project goals. Biological parameters to be measured shall be compared with reference conditions in other Suisun Bay tidal marshes and shall include at a minimum vegetation structure and composition in the landscape elements that are part of the design; the use of constructed channel habitats by fishes; and bird use of constructed habitats. The plan shall include reporting and verification procedures and contingency measures and shall be implemented for the life of the project.	LS

S = Significant Impact    LS = Less-Than-Significant Impact    SU = Significant Unavoidable Impact    NA = Not Applicable

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
P-BIO-3a: Sediment placement would eliminate up to 524 acres of habitat known or likely to support the endangered SMHM. The revised Project design would not provide sufficient quality and quantity of replacement habitat.	S	S	P-BIO-3a: Mitigation requirements for the SMHM would be finalized by the Corps as part of Section 7 (Endangered Species Act) consultation with USFWS. The lead agencies would require the implementation of measures consistent with the Final EIR/EIS recommendations, which derive from the mitigation plan presented in Appendix Q.1. The actual habitat acreages and performance criteria required as part of the mitigation would be as described in Appendix Q.1 or, if not, as required by USFWS to achieve the same goals.	LS
P-BIO-3b: The Project would eliminate burrowing owl nest sites and could injure or kill nesting birds of this species.	S	LS	P-BIO-3b: To mitigate the loss of burrowing owl nest sites, the Applicant shall take measures to ensure that the burrowing owl nesting population on the project site remains at levels within or exceeding the range that has been historically observed. The following measures shall be implemented prior to the initiation of grading or fill placement in each phase of the wetland restoration: <ul style="list-style-type: none"><li>• The extent of burrowing owl nesting throughout the project site shall be assessed annually during the May-July nesting season.</li><li>• Based on the most recent data available, artificial burrows in excess of the number of burrowing owls that be could be impacted in wetland restoration areas shall be constructed in upland-buffer portions of the project site, if possible in the vicinity of active ground squirrel colonies.</li></ul>	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
P-BIO-3b (continued)	S	S	<ul style="list-style-type: none"><li>• A qualified biologist, as permitted by the CDFG, shall capture and relocate any burrowing owls residing in impact areas to the artificial burrow sites. Owl capture and relocation shall occur during early spring, when the owls normally return from migration and initially occupy burrows prior to nesting. The biologist shall confirm the absence of burrowing owls from impact areas and ensure that all sites that could be attractive to owls are collapsed or sealed to prevent future occupancy.</li><li>• As permitted by CDFG, owls may be captured and relocated to artificial burrows on the project site from burrows that are about to be destroyed in non-project areas such as in the Central Valley.</li></ul>	LS
P-BIO-3c: The Project could have localized short-term impacts on special status fish species.	S	S	P-BIO-3c: Fish screens shall be provided at any intakes and outlets during construction and sediment placement phases of the project to reduce impacts to juveniles and adults of special status fish species per specifications of CDFG, NMFS, and USFWS. Levee breaches for each phase shall be sited to avoid well-developed stands of emergent vegetation that provide important habitat for special status fishes.	LS
P-BIO-3d: The Project would eliminate 0.39 acre of vernal pool habitat that supports the federally listed vernal pool fairy shrimp.	S	S	P-BIO-3d: Prior to impacting seasonally ponded areas that provide habitat for federally listed vernal pool invertebrates, the Applicant shall provide on- or off-site mitigation to preserve and create vernal pool habitats, according to acreage ratios and procedures approved by the USFWS.	LS
P-BIO-3e: The Project could eliminate individuals or local populations of special status plants, including the state-listed rare Mason's lilaeopsis.	S	S	P-BIO-3e: Measures to protect and enhance populations of rare plants that may occur in areas of project impact shall be implemented as described in the <i>Rare Plant Resource Mitigation and Restoration Plan for the Montezuma Wetlands Project</i> (Fiedler and Zebell 1995), which is included in Appendix Q.3.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
P-BIO-4: Placement of sediment would cover existing mosquito control ditches. Increased seasonal ponding could increase mosquito populations during Project construction and implementation.	S	LS	P-BIO-4: To prevent nuisance and public health effects associated with mosquito production, final designs for each phase of the Project shall be reviewed by the Solano County Mosquito Abatement District. The District will also conduct periodic inspections of the site during construction and following tidal restoration. Based on the District's review, the Project design shall incorporate measures which are non-hazardous to fish and wildlife that are deemed sufficient by the District to limit mosquito production. The Applicant shall provide access and funding as necessary for inspections mosquito control by the District.	LS
P-BIO-5: The successful restoration of tidal shallow water, wetland habitats, and sensitive species habitats, with transitional upland and buffer areas as proposed, could provide significant ecological benefits to sensitive plants, and to fish and wildlife, including threatened and endangered Delta fishes, and to the Suisun Marsh system as a whole.	NA	S	No mitigation required for a beneficial impact.	NA
G. CULTURAL RESOURCES				
P-CULT-1: Grading and excavation in areas of historic and prehistoric uplands have the potential to impact buried cultural resource sites.	S	S	P-CULT-1: If potentially significant archaeological resources are identified, construction shall be temporarily redirected until the materials can be evaluated pursuant to state and federal guidelines. A Programmatic Agreement (PA) shall be developed between the Applicant, Solano County, and the Corps of Engineers that provides specifications of this process. The Corps' archaeologist shall make determinations regarding resource significance, and consult with the SHPO on appropriate mitigation.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
G. CULTURAL RESOURCES				
P-CULT-2: Given the high potential for cultural resources on the site, previously unidentified human remains could be discovered during construction of the Project.	S	S	P-CULT-2: In addition to mitigation measure P-CULT-1, in the event that potential human remains are encountered, the materials shall be subject to section 7050.5(b) of the California Health and Safety Code and Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601; 104 Stat. 3048). The representatives onsite shall be members of the tribe most likely to have descended from those individuals prehistorically inhabiting the Project site.	LS
P-CULT-3: The construction of the proposed public access south of Fire Truck Road could disrupt buried artifacts.	S	S	P-CULT-3: In addition to mitigation measure P-CULT-1, no grading or excavation shall be done to construct the access area. Fill shall be used to create a level public access area. Buried artifacts, if present, shall remain intact following the completion of construction, and thus will not be adversely impacted. A detailed public access plan which shows existing topography, proposed topography, and proposed improvements shall be prepared and submitted to the County for review and approval prior to commencement of any public access construction.	LS
P-CULT-4: Use of the Project site would affect historical features that are considered potentially eligible for inclusion on the National Register of Historic Places and are potentially significant under CEQA Appendix K criteria.	S	S	P-CULT-4: In addition to mitigation measure P-CULT-1, if avoidance of any prehistoric or historic site is infeasible, a Programmatic Agreement (PA) shall be developed among the Applicant, Solano County, and the Corps of Engineers. The PA shall incorporate relevant federal, state, and local guidelines for performing the phased data recovery of impacted cultural resources, including significant assessment, mitigation, and evaluation and treatment of unexpected resources encountered during construction.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
H. TRAFFIC, ACCESS, AND CIRCULATION				
<u>P-CIR-1</u> : The Project would create circulation and possible safety conflicts with existing Jerico Towing Company, a water-related industry. Page 91 of the Solano County LUCE requires protecting surrounding uses from adverse impacts.	LS	LS	No mitigation required.	LS
<u>P-CIR-2</u> : Dump trucks transporting aggregate road base could result in damage to local road surfaces.	LS	LS	<u>P-CIR-2</u> : Any pavement damage resulting from project activity shall be restored to the pre-construction condition to the satisfaction of the Solano County Transportation Department.	LS
<u>P-CIR-3</u> : Project-related vessel traffic may cause temporary conflicts with recreational or commercial vessels using the Sacramento River and adjacent waterways (McDougal Cut and Montezuma Slough) near the Project site.	LS	LS	<u>P-CIR-3a</u> : The Project contractor shall provide waterway markers along the transport route to warn or advise recreational and commercial boaters of hazards or equipment nearby, pursuant to Title 14 of the California Code of Regulations.  <u>P-CIR-3b</u> : The Project contractor shall post a "local notice to mariners" using standard navigational procedures including the U.S. Coast Guard, boating publications, notices, etc., to warn boaters of project-related vessel traffic.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
I. AIR QUALITY				
<u>P-AIR-1</u> : Construction would create fugitive dust (PM10) which would elevate local levels of suspended particulates. Suspended particulates could reach unhealthful levels at nearby residences.	S	S	<u>P-AIR-1</u> : <ul style="list-style-type: none"><li>• Water all active construction areas at least twice daily. During dry weather, treat bare soil in construction area with hygroscopic stabilizers, such as magnesium chloride or calcium chloride) after watering.</li><li>• Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (e.g., distance between hauled material and top of truck).</li><li>• Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.</li><li>• Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas.</li><li>• Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).</li><li>• Limit traffic speeds on unpaved roads to 15 mph.</li><li>• Replant vegetation in disturbed areas as quickly as possible.</li><li>• Suspend excavation and grading activity when winds exceed 25 mph.</li></ul>	LS
<u>P-AIR-2</u> : Emissions from operation-phase activities (including rehandling facility operations) would exceed the BAAQMD standard of 80 pounds per day for ROG, NOx, SOx, and PM10	S	S	<u>P-AIR-2</u> : Diesel engines shall meet BAAQMD standards and shall be properly maintained and regularly tuned according to the manufacturers' specifications to ensure efficient operation.	SU

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
J. NOISE				
P-NOISE-1: Equipment, vehicles, and activities during grading and construction would increase noise levels temporarily for area residents and recreationists.	LS	LS	P-NOISE-1: To reduce construction noise levels, intake and exhaust ports on power construction equipment should be muffled or shielded, and shrouds or shields used to reduce noise from impact tools.	LS
P-NOISE-2: Equipment, vehicles, and activities during operation would increase noise levels for area residents and recreationists.	S	S	P-NOISE-2: <ul style="list-style-type: none"><li>The project shall not cause outdoor noise levels in residential areas in Collinsville along Collinsville Road to exceed 50 dBA CNEL as measured at the boundary of the residential areas, and/or 45 dBA CNEL as measured within the interiors of homes in these areas. Noise levels shall be monitored to confirm compliance with this requirement. If noise levels are exceeded, equipment and/or operations shall be modified as necessary to achieve compliance.</li><li>Construction equipment used by the Project shall include mufflers or shields to reduce noise. Slurry pumps shall be equipped with "critical" grade silencers and enclosed.</li><li>An acoustical engineer shall develop a noise reduction plan to minimize pump levels below noise standards specified in the Collinsville-Montezuma Hills Area Plan.</li></ul>	LS
K. RECREATION				
P-REC-1: Approximately 245 acres of area leased to the Birds Landing Hunting Preserve and Sporting Clays would be converted to tidal marsh, eliminating about 60 acres that now provides hunting for game such as pheasant, rabbit and snipe, which depend on dry grassland habitats. The Hunting Preserve's recreational use would be disrupted during construction.	LS	LS	No mitigation required.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
<b>K. RECREATION</b>				
<u>P-REC-2</u> : Project construction activities would adversely affect access to the recreational activities at the DWR Day Use Area on Montezuma Slough.	LS	LS	<u>P-REC-2</u> : Access should be provided to the Day Use Area during construction. Any short-term temporary road closures should be reviewed and approved by the County.	LS
<b>L. POPULATION, HOUSING, AND EMPLOYMENT</b>				
The Montezuma project would not significantly affect the population, housing or employment of the area or the region.				
<b>M. VISUAL RESOURCES</b>				
<u>P-VIS-1</u> : The Proposed Project would change the visual character of the shoreline area from natural open space and marsh to industrial use, for approximately 10 to 15 years.	LS	LS	<u>P-VIS-1</u> : Improvements proposed along the river shall be designed to blend with the surroundings as much as possible. A paint scheme shall be developed for the pumping facilities, the off-loading suction pipe, fuel storage tank, and ancillary buildings, which is compatible with the natural setting.	LS
<u>P-VIS-2</u> : Contrary to Solano County and BCDC policies, relocated electric distribution and telephone lines are proposed to be placed above ground, resulting in potential adverse impact on visual resources. Wires would be at least 6 feet apart to protect birds from electrocution.	LS	LS	No mitigation required.	LS
<u>P-VIS-3</u> : The off-loading and rehandling facilities would require night lighting during periods of 24-hour operation.	LS	LS	<u>P-VIS-3</u> : All night lighting shall be designed to direct light onto work areas and to prevent unnecessary direct exposure of lights to adjacent areas.	LS

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Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
N. UTILITIES AND PUBLIC SERVICES				
P-UTIL-1: Existing electric distribution and telephone lines are proposed to be relocated above ground, contrary to Solano County and BCDC policy, potentially adversely affecting wildlife habitat and visual resources. Wires would be at least 6 feet apart to protect birds from electrocution.	LS	LS	No mitigation required.	LS
O. ECONOMIC AND FISCAL FACTORS				
P-ECON-1: The Proposed Project would displace grazing activity on 1,822 acres and hunting on 360 acres.	NA	LS	No mitigation required.	LS
P-ECON-2: The Proposed Project would significantly increase disposal capacity for dredged materials, which would help maintain navigation channels, indirectly maintaining or increasing port-related economic activity, and adding local income in Solano County.	NA	S	No mitigation required for a beneficial impact.	NA
P-ECON-3: The Proposed Project would result in an operating surplus for the County.	NA	LS	No mitigation required for a beneficial impact.	NA
P-ECON-4: If the Project were to be initiated but abandoned prior to or after its proposed completion, remediation or continued maintenance and operation, may be required to prevent the release of contaminants. This could be a significant impact on County financial resources. Should adequate County financial resources not be available, this in turn could result in potentially significant physical environmental impacts.	S	S	P-ECON-4: A Project Mitigation Monitoring and Reporting Plan (MMRP) shall be prepared before issuance of the County use permit. The MMRP will provide a checklist for all aspects of Project monitoring and will aid County staff in assessing Project progress and the development of potential problems. The Applicant shall be required to post bonds or appropriate financial assurances in an amount sufficient to perform remediation and restoration, or on-going maintenance and operation. The amount and timing of the bonds would be commensurate with the volume and type of sediment placed at the restoration site. The approach for calculating the bond amount will be determined during preparation of the County use permit.	LS

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July 1998

Table 3-1  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Proposed Project  
(continued)

Impacts		Significance Prior to Mitigation	Mitigation Measures	Significance After Mitigation
O. ECONOMIC AND FISCAL FACTORS				
P-ECON-5: If restored wetlands are donated to a public or non-profit entity at the end of the Project's life, there would be an unspecified cost to this entity associated with long-term management, maintenance, and monitoring of the Project site.	LS		P-ECON-5: The County shall require that the Applicant establish a self-supporting fund to reimburse any public or non-profit entity that takes over the site and provides long-term management and maintenance. Details as to the form and amount of such fund shall be worked out prior to permitting.	LS
	LS			

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Table 3-2  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 1: Managed Wetland

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
<b>A. LAND USE</b>				
Same as Proposed Project (see Table 3-1)				
Other land use impacts are related to disturbance of surrounding and on-site uses during construction and operation phases of the project. These impacts are identified under the appropriate topic. See Traffic, Circulation and Access; Air Quality; Noise; Recreation; and Utilities sections in this table and in the EIR/EIS.				
<b>B. POLICY</b>				
Same as Proposed Project (P-POL in Table 3-1)				
<b>C. GEOLOGY AND SEISMICITY</b>				
Same as Proposed Project (P-GEO in Table 3-1)				
<b>D. SEDIMENT QUALITY</b>				
Same as Proposed Project (P-SED in Table 3-1)				
<b>E. HYDROLOGY AND WATER QUALITY</b>				
No impacts on Hydrology/Geomorphology				
Surface Water Quality impacts and mitigations as described for P-WQ-1, P-WQ-2, and P-WQ-3 ( Table 3-1); P-WQ-4 not applicable				
Groundwater impacts and mitigations same as Proposed Project (P-GW in Table 3-1)				

S = Significant Impact    LS = Less-Than-Significant Impact    SU = Significant Unavoidable Impact    NA = Not Applicable



Table 3-2  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 1: Managed Wetland  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
Impacts and mitigations related to contaminant release same as for Proposed Project (P-BIO-1 in Table 3-1)				
Impacts and mitigations related to ecological value and function same as for Proposed Project (P-BIO-2 in Table 3-1)				
Impacts and mitigations related to special status species same as for Proposed Project (P-BIO-3 in Table 3-1)				
Impact and mitigation related to mosquitos same as for Proposed Project (P-BIO-4 in Table 3-1)				
Impact 1-BIO-5: The enhancement of extensive seasonal wetlands could provide significant environmental benefits to wildlife, particularly waterfowl	NA	S	NA	NA
G. CULTURAL RESOURCES				
Impacts and mitigations same as for Proposed Project (P-CULT in Table 3-1)				
H. TRAFFIC, ACCESS, AND CIRCULATION				
Impacts and mitigations same as for Proposed Project (P-CIR in Table 3-1)				
I. AIR QUALITY				
Impacts and mitigations same as for Proposed Project (P-AIR in Table 3-1)				
J. NOISE				
Impacts and mitigations same as for Proposed Project (P-NOISE in Table 3-1)				

S = Significant Impact    LS = Less-Than-Significant Impact    SU = Significant Unavoidable Impact    NA = Not Applicable

SUMMARY OF IMPACTS AND MITIGATION MEASURES

Alternative 1: Managed Wetland

(continued)

Significance After Mitigation	Mitigation Measures	Significance Prior to Mitigation	Impacts		
			County	Corps	
K. RECREATION					
Impacts and mitigations same as for Proposed Project (P-REC in Table 3-1)					
L. POPULATION, HOUSING, AND EMPLOYMENT					
Alternative 1 would not significantly affect the population, housing or employment of the area or the region.					
M. VISUAL RESOURCES					
Impacts same as for Proposed Project; less than significant					
N. UTILITIES AND PUBLIC SERVICES					
Impact same as for Proposed Project; less than significant					
O. ECONOMIC AND FISCAL FACTORS					
Impacts and mitigations same as for Proposed Project (P-ECON in Table 3-1)					

S = Significant Impact LS = Less-Than-Significant Impact SU = Significant Unavoidable Impact NA = Not Applicable

Table 3-3  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 2: Combined Wetland

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
A. LAND USE				
Same as Proposed Project (see Table 3-1)				
Other land use impacts are related to disturbance of surrounding and on-site uses during construction and operation phases of the project. These impacts are identified under the appropriate topic. See Traffic, Circulation and Access; Air Quality; Noise; Recreation; and Utilities sections in this table and in the EIR/EIS.				
B. POLICY				
Same as Proposed Project (P-POL in Table 3-1)				
C. GEOLOGY AND SEISMICITY				
Same as Proposed Project (P-GEO in Table 3-1)				
D. SEDIMENT QUALITY				
Same as Proposed Project (P-SED in Table 3-1)				
E. HYDROLOGY AND WATER QUALITY				
Hydrology/Geomorphology impacts and mitigations same as Proposed Project (P-HYDRO in Table 3-1)				
Surface Water Quality impacts and mitigations same as Proposed Project (P-WQ in Table 3-1)				
Groundwater impacts and mitigations same as Proposed Project (P-GW in Table 3-1)				
F. BIOLOGICAL RESOURCES				
Impacts and mitigations related to contaminant release same as for Proposed Project (P-BIO-1 in Table 3-1)				
Impacts and mitigations related to ecological value and function same as for Proposed Project (P-BIO-2 in Table 3-1)				

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July 1998

SUMMARY OF IMPACTS AND MITIGATION MEASURES

Alternative 2: Combined Wetland

(continued)

Significance After Mitigation	Mitigation Measures	Significance Prior to Mitigation	Impacts		
			County	Corps	

**F. BIOLOGICAL RESOURCES**  
Impacts and mitigations related to special status species same as for Proposed Project (P-BIO-3 in Table 3-1)

Impact and mitigation related to mosquitos same as for Proposed Project (P-BIO-4 in Table 3-1)

2-BIO-5: The restoration of extensive transitional intertidal habitats and possible final restoration of tidal marsh could provide significant ecological benefits to fish and wildlife, and to the Suisun Marsh system. The enhancement of extensive seasonal diked wetlands also could provide significant ecological benefits to wildlife, particularly waterfowl.	NA	S	NA	NA

**G. CULTURAL RESOURCES**  
Impacts and mitigations same as for Proposed Project (P-CULT in Table 3-1)

**H. TRAFFIC, ACCESS, AND CIRCULATION**  
Impacts and mitigations same as for Proposed Project (P-CIR in Table 3-1)

**I. AIR QUALITY**  
Impacts and mitigations same as for Proposed Project (P-AIR in Table 3-1)

**J. NOISE**  
Impacts and mitigations same as for Proposed Project (P-NOISE in Table 3-1)

S = Significant Impact LS = Less-Than-Significant Impact SU = Significant Unavoidable Impact NA = Not Applicable

Table 3-3  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 2: Combined Wetland

(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
K. RECREATION				
Impacts and mitigations same as for Proposed Project (P-REC in Table 3-1)				
L. POPULATION, HOUSING, AND EMPLOYMENT				
Alternative 2 would not significantly affect the population, housing or employment of the area or the region.				
M. VISUAL RESOURCES				
Impacts same as for Proposed Project; less than significant				
N. UTILITIES AND PUBLIC SERVICES				
Impact same as for Proposed Project; less than significant				
O. ECONOMIC AND FISCAL FACTORS				
Impacts and mitigations same as for Proposed Project (P-ECON in Table 3-1)				

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
A. LAND USE				
3-LU-1: Removal of 1,500 acres of agricultural land could be a significant impact on the County's agricultural resources.	S	LS	3-LU-1: If this impact were to prove significant upon further review by Marin County, a transfer of development rights could be implemented through coordination with the Marin Agricultural Land Trust.	SU
Other land use impacts are related to disturbance of surrounding and on-site uses during construction and operation phases of the project. These impacts are identified under the appropriate topic. See Traffic, Circulation and Access; Air Quality; Noise; Recreation; and Utilities sections in this table and in the EIR/EIS.				
B. POLICY				
3-POL-1: Filling and diking would be inconsistent with Marin County Policies EQ-2.44 and EQ-2.45, which encourage the protection of wetland habitats without diking or filling.	S	LS	3-POL-1: Amendments of Policies EQ-2.44 and EQ-2.45 to allow diking and filling for wetlands restoration shall be required.	LS
3-POL-2: Filling the site would be inconsistent with the F-1 and F-2 zones, which are designed to provide storage for Novato Creek flood waters on the site.	S	LS	3-POL-2: The wetland restoration project shall be designed so that adequate flood water storage capacity is available.	LS
3-POL-3: Alternative 3 would eliminate oat hay farming on the portion of the site that is converted to wetlands. The BCDC policies on diked historic baylands and the San Francisco Bay Plan policies require agricultural land to be protected unless an agricultural use is no longer economically viable. In addition, the Marin County Comprehensive Plan encourages the retention of agriculture on this site.	S	LS	Mitigation Measure 3-LU-1 shall be required to mitigate this impact to a less than significant level.	LS
3-POL-4: This alternative would contribute significantly to the regional goals for the long-term management of dredged materials in the San Francisco Bay estuary.	NA	S	No mitigation required for a beneficial impact.	S

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
C. GEOLOGY AND SEISMICITY				
3-GEO-1: Same as P-GEO-1 (Table 3-1)	S	LS	3-GEO-1: Same as P-GEO-1 (Table 3-1)	LS
3-GEO-2: Same as P-GEO-1 (Table 3-1)	S	S	3-GEO-2: Same as P-GEO-1 (Table 3-1)	LS
3-GEO-3: Because of underlying compressible materials, the alternative has the potential to create mudwaves, which could lead to levee instability, increasing the potential for exposure of non-cover sediments to the environment. Secondly, mudwaves could form adjacent to the site, creating a navigation hazard in Novato Creek or in the Bel Marin Keys lagoon	S	S	3-GEO-3: If mudwaves form, construction shall be stopped until excess pore water pressures dissipate, the mudwave stabilizes, and the extent of surface deformation to levees and to adjacent waters are evaluated by a geotechnical engineer. Levees shall be reinforced or repaired as necessary, and any persistent navigation hazards shall be removed. The rate of sediment placement shall be reduced, based on the recommendations of the geotechnical engineer. Additional preventive measures are as follows:  Prior to the placement of any fill on the site, the Project Applicant shall fulfill the following requirements:  • A baseline hydrographic survey of Novato Creek and the Bel Marin Keys lagoon shall be conducted before construction begins in Phase I to provide the basis for identifying and correcting any deformation caused by mudwaves. Prior to the placement of any fill on the site, the Project Applicant shall fulfill the following requirements:	LS

S = Significant Impact    LS = Less-Than-Significant Impact    SU = Significant Unavoidable Impact    NA = Not Applicable

Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
C: GEOLOGY AND SEISMICITY				
3-GEO-3 (continued)			<ul style="list-style-type: none"><li>• For all types of project levees: settlement of levees shall be monitored in conjunction with the monitoring program proposed for assessing fill elevations in the sediment placement cells and repairs made, as necessary. The levee design will be modified if the results of the proposed geotechnical evaluations indicate that changes are required for levee stability. The rate of sediment placement operations will be reduced to allow for dissipation of pore water pressures.</li><li>• For non-cover separation and cell levees: surcharge loads shall be kept significantly below foundation material shear strengths (thin lifts, slow rate of loading).</li><li>• For interphase levees: drainage of foundation shall be facilitated with sand/wick drains if the subdrain system proves ineffective in reducing pore-pressure buildup.</li></ul>	
3-GEO-4: Same as P-GEO-4 (Table 3-1)	S	S	3-GEO-4: Same as P-GEO-4 (Table 3-1)	LS

S = Significant Impact    LS = Less-Than-Significant Impact    SU = Significant Unavoidable Impact    NA = Not Applicable



Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
C. GEOLOGY AND SEISMICITY				
3-GEO-5: Downdrag on the piles may occur due to loading of the clay crust, causing damage to existing transmission line towers on site.	S	S	3-GEO-5: A soils engineer shall conduct design-level subsurface geotechnical investigation and incorporate recommendations into a comprehensive, detailed geotechnical design and engineering plan. A comprehensive monitoring program of settlement shall be performed.	LS
D. SEDIMENT QUALITY				
3-SED-1: Same as P-SED-1(Table 3-1)	S	S	3-SED-1: Same as P-SED-1(Table 3-1)	LS
3-SED-2: Same as P-SED-2(Table 3-1)	S	S	3-SED-2: Same as P-SED-2(Table 3-1)	LS
E. HYDROLOGY AND WATER QUALITY				
3-HYDRO-1: The Phase II levee breach could cause the enlargement of the channel of Novato Creek, and the Phase I breach would cause a new channel to form across the mud flat.	LS	LS	No mitigation required.	LS
3-HYDRO-2: Wetlands restoration would reduce the flood storage capacity of the area.	S	S	3-HYDRO-2: A new channel could be constructed to offset any flooding impact. The implications of reducing the basin capacity for flood storage should be carefully determined by hydraulic modeling. The environmental impacts of excavating a new flood control channel would require more detailed evaluation.	LS
3-HYDRO-3: Same as P-HYDRO-3 (Table 3-1)	S	S	3-HYDRO-3: Same as P-HYDRO-3 (Table 3-1)	LS
3-HYDRO-4: Same as P-HYDRO-4 (Table 3-1)	LS	LS	3-HYDRO-4: Same as P-HYDRO-4 (Table 3-1)	LS
3-HYDRO-5: Same as P-HYDRO-5 (Table 3-1)	S	S	3-HYDRO-5: Same as P-HYDRO-5 (Table 3-1)	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
E. HYDROLOGY AND WATER QUALITY				
<u>3-WQ-1</u> : There may be an increase in the concentration of contaminants in water in the make-up water pond, which, if discharged to San Pablo Bay, would violate water quality standards.	S	S	<u>3-WQ-1</u> : To mitigate potential impacts related to discharges from the make-up water pond into the shallow waters of San Pablo Bay, a water discharge pipeline could be constructed, allowing discharge into deeper waters farther offshore. If this is not feasible, and in any case, operations should be managed as necessary to meet applicable discharge criteria. All mitigation measures included under P-WQ-1 for the Proposed Project would also be required for this alternative.	LS
<u>3-WQ-2</u> : Construction and operation of the off-loading facility and pipeline would locally increase suspended sediment concentrations in San Pablo Bay.	LS	LS	No mitigation required.	LS
F. BIOLOGICAL RESOURCES				
<u>3-BIO-1a</u> : Same as P-BIO-1a (Table 3-1)	S	S	<u>3-BIO-1a</u> : Same as P-BIO-1a (Table 3-1)	LS
<u>3-BIO-1c</u> : Same as P-BIO-1a (Table 3-1)	S	S	<u>3-BIO-1c</u> : Same as P-BIO-1c (Table 3-1)	LS

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July 1998

Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts		Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
		County	Corps		
F. BIOLOGICAL RESOURCES					
3-BIO-2a: Tidal wetland restoration at the Bel Marin Keys site would result in losses of existing seasonal wetland habitats and associated ecological functions and values.		S	S	3-BIO-2a: To offset temporary losses of wetland functions and values water management focused on providing interim wetlands enhancement in unfilled project phases shall be incorporated into the Project. Unfilled areas shall be managed to provide seasonal wetland habitat values for shorebirds and waterfowl. Water management shall consist of operating existing pumps and drainage structures to control the extent and duration of seasonal flooding, and shall start during construction and continue during the period of sediment placement, but shall be terminated prior to construction within that phase. If necessary to mitigate seasonal wetland habitat losses, seasonal wetlands could be incorporated into a revised project design for this site.	LS
3-BIO-2c: Same as P-BIO-2c (Table 3-1)		S	S	3-BIO-2c: Same as P-BIO-2c (Table 3-1)	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
3-BIO-2e: The attainment of restoration and mitigation objectives is uncertain without the development and implementation of a comprehensive monitoring plan that includes monitoring, reporting, and verification procedures, performance criteria, and contingencies.	S	S	3-BIO-2e: A comprehensive monitoring plan shall be finalized with the approval of permitting agencies prior to project implementation. The monitoring plan shall include the methodology by which physical, chemical, and biological parameters shall be measured to establish the attainment of project goals. Biological parameters to be measured shall be compared with reference conditions in other San Pablo Bay tidal marshes and shall include at a minimum vegetation structure and composition in the landscape elements that are part of the design; the use of constructed channel habitats by fishes; and bird use of constructed habitats. The plan shall include reporting and verification procedures and contingency measures.	LS

**F. BIOLOGICAL RESOURCES**

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
<u>3-BIO-3</u> : This alternative could result in adverse impacts to special status species, including SMHM and California clapper rail in tidal salt marsh outboard of the perimeter levee and special status fish species that may be entrained in pumps at the offloading facility.	S	S	<u>3-BIO-3</u> : Levee breaches and sediment pumps should be sited to avoid known clapper rail breeding territories and areas of high-quality salt marsh. During the construction and dredged sediment placement phases, fish screens shall be provided at intakes and outlets to reduce impacts to adults. Impacts to eggs, larvae, and juveniles shall be minimized to the extent practical by not pumping or diverting water during the spawning season. The design and operation of fish screens shall be in accordance with NMFS requirements.	LS
<u>3-BIO-5</u> : The successful restoration of extensive tidal mudflats and salt marsh would provide significant ecological benefits to fish and wildlife, including the endangered California clapper rail, black rail, and salt marsh harvest mouse, and to San Pablo Bay wetlands as a whole.	NA	S	No mitigation required.	NA

G. CULTURAL RESOURCES

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
G. CULTURAL RESOURCES				
3-CULT-1: Implementation of this alternative could have an adverse effect on previously undocumented archaeological or historical materials that could be discovered during construction.	S	S	3-CULT-1: The site area shall be systematically investigated by a qualified archaeologist, and any cultural resources discovered shall be evaluated for potential significance. The Corps' archaeologist shall make determinations as to significance and shall consult with the State Historic Preservation Office (SHPO) regarding appropriate mitigations, which shall be incorporated into the project design. If potentially significant archaeological resources are identified, construction shall be temporarily redirected until the materials can be evaluated pursuant to state and federal guidelines. A Programmatic Agreement (PA) shall be developed between the Applicant, Marin County, and the Corps of Engineers that provides specifications of this process. The Corps' archaeologist shall make determinations regarding resource significance, and consult with the SHPO on appropriate mitigation.	LS
3-CULT-2: Demolition of the existing pumphouse would constitute a significant loss of historic resources, if these buildings are eligible for the National Register of Historic Places.	S	S	3-CULT-2: In addition to mitigation measure 3-CULT-1, the pumphouse shall be evaluated by a qualified architectural historian to determine if it is eligible for the National Register. The Corps' archaeologist shall determine the significance of the resource and consult with the SHPO regarding appropriate mitigation. Procedures to preserve any eligible resource shall be integrated into a Programmatic Agreement (PA) between the Applicant, Marin County, and the Corps of Engineers.	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
H. TRAFFIC, ACCESS, AND CIRCULATION				
3-CIR-1: Alternative 3 would increase the level of service from LOS C to approaching LOS D at Bel Marin Keys Boulevard and Digital Drive, and from LOS D to approaching LOS E at Bel Marin Keys Boulevard and Commercial Boulevard.	S	LS	3-CIR-1: The westbound right-turn lane shall be converted to a left-turn lane, and a second westbound left-turn lane and a third southbound through lane should be added to improve the intersection to LOS C during the P.M. peak hour.	LS
I. AIR QUALITY				
3-AIR-1: Construction would create fugitive dust (PM10), which would elevate local levels of suspended particulates. Suspended particulates could reach unhealthful levels at nearby residences.	S	S	3-AIR-1: <ul style="list-style-type: none"><li>Water all active construction areas at least twice daily.</li><li>Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.</li><li>Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.</li><li>Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas.</li><li>Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).</li></ul>	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
I. AIR QUALITY				
3-AIR-1 (Continued)			<ul style="list-style-type: none"><li>• Limit traffic speeds on unpaved roads to 15 mph.</li><li>• Replant vegetation in disturbed areas as quickly as possible.</li><li>• Suspend excavation and grading activity when winds exceed 25 mph.</li></ul>	
3-AIR-2. Emissions from operation-phase activities would exceed the BAAQMD significance threshold of 80 pounds per day for ROG, SO <sub>x</sub> , and NO <sub>x</sub>	S	S	3-AIR-2. Diesel engines shall meet BAAQMD standards and shall be properly maintained and regularly tuned according to the manufacturers' specifications to ensure efficient operation.	SU
J. NOISE				
3-NOISE-1: Equipment, vehicles, and activities during grading and construction would increase noise levels temporarily in the eastern portions of the Bel Marin Keys development along Bel Marin Keys Boulevard and Bahama Reef.	S	LS	3-NOISE-1: <ul style="list-style-type: none"><li>• Muffle and shield all intake and exhaust ports on power construction equipment, and shroud or shield all impact tools.</li><li>• Where such equipment is available and feasible, use electric, rather than gas or diesel construction equipment.</li></ul>	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
3-NOISE-2: Equipment, vehicles, and activities during operation would increase noise levels for area residents and recreationists.	S	S	<p><u>3-NOISE-2:</u></p> <ul style="list-style-type: none"> <li>The Project shall not cause noise levels in residential areas of Bel Marin Keys to exceed 65 dBA (Ldn). Noise levels shall be monitored at appropriate locations to confirm compliance with this requirement. If noise levels are exceeded, equipment and/or operations shall be modified as necessary to achieve compliance.</li> <li>Install "critical" grade silencers and enclose each pump.</li> <li>An acoustical engineer shall develop a noise reduction plan to minimize pump levels below regulatory standards.</li> </ul>	LS
<b>K. RECREATION</b>				
No recreational areas would be affected by wetlands restoration on the Bel Marin Keys site.				
<b>L. POPULATION, HOUSING AND EMPLOYMENT</b>				
3-HOUS-1: The Bel Marin Keys alternative would preclude the development of housing on the site. This would be inconsistent with County zoning, which allows one dwelling unit per two acres on the site, and would hinder the County's efforts to meet its housing needs	S	LS	3-HOUS-1: A portion of the site shall be reserved for housing development.	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
M. VISUAL RESOURCES				
3-VIS-1: The off-loading and pumping facilities in the Bay would have a minor visual impact on views from the shoreline and from the Bay.	LS	LS	3-VIS-1: Improvements shall be designed to blend with the surroundings as much as possible. A paint scheme and design shall be developed for the pumping facilities, the off-loading suction pipe, fuel storage tank, and ancillary buildings which are compatible with the Bay setting.	LS
3-VIS-2: Contrary to BCDC policy, new electric distribution and telephone lines are proposed to be placed above ground, resulting in an adverse impact on visual resources. Wires would be at least 6 feet apart to lessen potential impacts on birds.	LS	LS	No mitigation required.	LS
3-VIS-3: The off-loading facility would require night lighting during periods of 24-hour operation.	LS	LS	3-VIS-3: All night lighting shall be designed to direct light onto work areas and to prevent unnecessary direct exposure of lights to adjacent areas.	LS
N. UTILITIES AND PUBLIC SERVICES				
3-UTIL-1: New electric distribution and telephone lines are proposed to be placed above ground, contrary to BCDC policy, potentially adversely affecting wildlife habitat and visual resources. Wires would be at least 6 feet apart to lessen potential impacts on birds.	LS	LS	No mitigation is suggested.	LS
N. UTILITIES AND PUBLIC SERVICES				
3-UTIL-2: Placement of dredged materials could raise the site elevation and cause settlement, which could affect stability of the PG&E 115 kV lines.	S	LS	3-UTIL-2: The existing transmission line shall be moved to the perimeter of the site. A 35-foot clearance between transmission lines and material placed shall be required.	LS

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Table 3-4  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 3: Bel Marin Keys Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
O. ECONOMIC AND FISCAL FACTORS				
3-ECON-1: This alternative would result in the loss of revenue from oat hay farming on 784 acres of land.	NA	S	3-ECON-1: Mitigation Measure 3-LU-1 shall be required to mitigate this impact.	LS
3-ECON-2: This alternative would significantly increase disposal capacity for dredged materials, which would help maintain navigation channels, indirectly maintaining or increasing port-related economic activity and adding income to Marin County.	NA	S	No mitigation required for a beneficial impact.	S
3-ECON-3: This alternative would result in an operating surplus for Marin County.	NA	LS	No mitigation required for a beneficial impact.	LS
3-ECON-4: If the project fails, remediation and restoration of the site to pre-project conditions, or continued maintenance and operation, would be required. This could be a major significant impact on Marin County financial resources.	NA	S	3-ECON-4: The Applicant shall be required to post bonds in an amount sufficient to perform remediation and restoration, or on-going maintenance and operation.	LS
3-ECON-5: If restored wetlands are donated to a public or non-profit entity at the end of the project's life, there would be an unspecified cost to this entity (or to the County if such an arrangement failed) associated with long-term management and maintenance of the project site.	NA	S	3-ECON-5: The County shall require that the Applicant establish a self-supporting fund to reimburse any public or non-profit entity that takes over the site and provides long-term management and maintenance.	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
A. LAND USE				
Alternative 4 would not significantly impact land use.				
B. POLICY				
4-POL-1: This alternative would contribute significantly to the regional goals for the long-term management of dredged materials in the San Francisco Bay estuary.	NA	S	No mitigation required for a beneficial impact.	S
C. GEOLOGY AND SEISMICITY				
4-GEO-1: Same as P-GEO-1 (Table 3-1)	S	S	4-GEO-1: Same as P-GEO-1 (Table 3-1).	LS
4-GEO-2: Same as P-GEO-1 (Table 3-1)	S	S	4-GEO-2: Same as P-GEO-1 (Table 3-1)	LS
4-GEO-3: Because of underlying compressible materials, the project has the potential to create mudwaves, which could lead to levee instability, increasing the potential for exposure of non-cover sediments to the environment.	S	S	4-GEO-3: If mudwaves form, construction shall be stopped until excess pore water pressures dissipate, the mudwave stabilizes, and the extent of surface deformation to levees is evaluated by a geotechnical engineer. Levees shall be reinforced or repaired as necessary. The rate of sediment placement reduced, based on the recommendations of the geotechnical engineer. Additional preventive measures are as follows:  Prior to the placement of any fill on the site, the Project Applicant shall fulfill the following requirements:  • For non-cover separation and cell levees: surcharge loads shall be kept significantly below foundation material shear strengths (thin lifts, slow rate of loading).	LS

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July 1998

Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
C. GEOLOGY AND SEISMICITY				
4-GEO-3 (continued)			<ul style="list-style-type: none"><li>For interphase levees: drainage of foundation shall be facilitated with sand/wick drains if the subdrain system proves ineffective in reducing pore-pressure buildup.</li><li>For all types of project levees: settlement of levees shall be monitored in conjunction with the monitoring program proposed for assessing fill elevations in the sediment placement cells and repairs made, as necessary. The levee design will be modified if the results of the proposed geotechnical evaluations indicate that changes are required for levee stability. The rate of sediment placement operations will be reduced to allow for dissipation of pore water pressures.</li></ul>	
4-GEO-4: Same as P-GEO-4 (Table 3-1)	S	S	4-GEO-4: Same as P-GEO-4 (Table 3-1)	LS
4-GEO-5: Downdrag on the piles may occur due to loading of the clay crust, causing damage to existing transmission line towers on site.	S	S	4-GEO-5: A soils engineer shall conduct design-level subsurface geotechnical investigation and incorporate recommendations into a comprehensive, detailed geotechnical design and engineering plan. A comprehensive monitoring program of settlement shall be performed.	LS
D. SEDIMENT QUALITY				
4-SED-1: Same as P-SED-1 (Table 3-1)	S	S	4-SED-1: Same as P-SED-1 (Table 3-1)	LS
4-SED-2: Same as P-SED-2 (Table 3-1)	S	S	4-SED-2: Same as P-SED-2 (Table 3-1)	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
E. HYDROLOGY AND WATER QUALITY				
<u>4-HYDRO-1</u> : The levee breaches would cause scour of channels through the existing marsh and across the mud flat. Some existing pickleweed marsh would be lost in the short term.	LS	LS	No mitigation required.	LS
<u>4-HYDRO-2</u> : Filling of Hamilton Airfield with dredged material could affect management of Ignacio Pond for flood control.	S	S	<u>4-HYDRO-2</u> : If necessary to provide continuing flood protection for adjacent property, the wetland restoration design for this site shall be modified to incorporate an area of diked, managed marsh that can, in emergency conditions, provide additional floodwater storage.	LS
<u>4-HYDRO-3</u> : Same as P-HYDRO-3 (Table 3-1)	S	S	<u>4-HYDRO-3</u> : Same as P-HYDRO-3 (Table 3-1)	LS
<u>4-HYDRO-4</u> : Same as P-HYDRO-4 (Table 3-1)	LS	S	<u>4-HYDRO-4</u> : Same as P-HYDRO-4 (Table 3-1)	LS
<u>4-HYDRO-5</u> : Same as P-HYDRO-5 (Table 3-1)	S	S	<u>4-HYDRO-5</u> : Same as P-HYDRO-5 (Table 3-1)	LS
<u>4-WQ-1</u> : There may be an increase in the concentration of contaminants in water in the make-up water pond, which, if discharged to San Pablo Bay, would violate water quality standards. Montezuma site.	S	S	<u>4-WQ-1</u> : To mitigate potential impacts related to discharges from the make-up water pond into the shallow waters of San Pablo Bay, a water discharge pipeline could be constructed, allowing discharge into deeper waters farther offshore. If this is not feasible, and in any case, operations should be managed as necessary to meet applicable discharge criteria. All mitigation measures included under P-WQ-1 for the Proposed Project would also be required for this alternative.	LS
<u>4-WQ-2</u> : Construction and operation of the off-loading facility and pipeline would locally increase suspended sediment concentrations in San Pablo Bay.	LS	LS	No mitigation required.	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
4-BIO-1: Same as P-BIO-1a (Table 3-1)	S	S	4-BIO-1a: Same as P-BIO-1a (Table 3-1)	LS
4-BIO-1c: Same as P-BIO-1c (Table 3-1)	S	S	4-BIO-1c: Same as P-BIO-1c (Table 3-1)	LS
4-BIO-2a: Tidal wetland restoration at the Hamilton site would result in losses of existing seasonal wetland habitats and associated ecological functions and values.	S	S	4-BIO-2a: To offset temporary losses of wetland functions and values water management focused on providing interim wetlands enhancement in unfilled project phases shall be incorporated into the Project. Unfilled areas shall be managed to provide seasonal wetland habitat values for shorebirds and waterfowl. Water management shall consist of operating existing pumps and drainage structures to control the extent and duration of seasonal flooding, and shall start during construction and continue during the period of sediment placement, but shall be terminated prior to construction within that phase. If necessary to mitigate seasonal wetland habitat losses, seasonal wetlands could be incorporated into a revised project design for this site.	LS
4-BIO-2c: Same as P-BIO-1a (Table 3-1)	S	S	4-BIO-2c: Same as P-BIO-1a (Table 3-1)	LS
4-BIO-2e: Same as P-BIO-1a (Table 3-1)	S	S	4-BIO-2e: Same as P-BIO-1a (Table 3-1)	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
F. BIOLOGICAL RESOURCES				
4-BIO-3: This alternative could result in adverse impacts to special status species, including SMHM and California clapper rail in tidal salt marsh outboard of the perimeter levee, burrowing owls nesting around the abandoned airfield, and special status fish species that may be entrained in pumps at the offloading facility.	S	S	4-BIO-3: Levee breaches and sediment pumps should be sited to avoid known clapper rail breeding territories and areas of high-quality salt marsh. The Project Applicant shall survey the site to confirm the presence or absence of nesting burrowing owls prior to initiation of any fill operations. If active nests are found within the fill area, impacts shall be mitigated as for the Proposed Project. During the construction and dredged sediment placement phases, fish screens shall be provided at intakes and outlets to reduce impacts to adults. Impacts to eggs, larvae, and juveniles shall be minimized to the extent practical by not pumping or diverting water during the spawning season. The design and operation of fish screens shall be in accordance with NMFS requirements.	LS
4-BIO-5: The successful restoration of extensive tidal mudflats and salt marsh would provide significant ecological benefits to fish and wildlife, including the endangered California clapper rail, black rail, and salt marsh harvest mouse, and to San Pablo Bay wetlands as a whole.	NA	S	No mitigation for a beneficial impact.	S

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
G. CULTURAL RESOURCES				
4-CULT-1: Implementation of this alternative could have an adverse effect on previously undocumented archaeological or historical materials that could be discovered during construction.	S	LS	4-CULT-1: A Programmatic Agreement (PA) shall be developed between the Applicant, City of Novato, and Corps of Engineers specifying procedures to be followed in the event that cultural resources are encountered during construction. Construction crews shall be instructed by the Project Applicant through conditions placed in the primary construction contract as to the potential to uncover archaeological or historic materials as part of land clearing and excavation activities. Should cultural materials be discovered during construction activities, the construction supervisor shall halt work immediately (within 100 feet of the find) and contact the Corps archaeologist for a determination of resource significance. The Corps archaeologist shall consult with the SHPO regarding appropriate mitigation.	LS
4-CULT-2: Potential dredge disposal and wetland creation would result in a significant impact on the Hamilton Historic District airfield runway.	S	S	4-CULT-2: The Applicant shall enter into a Programmatic Agreement (PA) with the Corps and City of Novato to coordinate appropriate mitigation to complement current measures addressing adverse effects to the airfield runway. The PA shall include measures such as contributing to public interpretation of the airfield (i.e., as part of the Novato Historical Guild museum and Army's mobile interpretative display), historical documentation, and written and photographic documentation for submittal to the Library of Congress, Historic American Building Survey.	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
H. TRAFFIC, ACCESS, AND CIRCULATION				
Alternative4 would not significantly impact traffic, access, and circulation.				
I. AIR QUALITY				
4-AIR-1: Construction would create fugitive dust (PM10), which would elevate local levels of suspended particulates. Suspended particulates could reach unhealthful levels at nearby residences.	S	S	4-AIR-1: <ul style="list-style-type: none"><li>Water all active construction areas at least twice daily.</li><li>Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.</li><li>Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.</li><li>Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas.</li><li>Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).</li><li>Limit traffic speeds on unpaved roads to 15 mph.</li><li>Replant vegetation in disturbed areas as quickly as possible.</li><li>Suspend excavation and grading activity when winds exceed 25 mph.</li></ul>	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
I. AIR QUALITY				
4-AIR-2: Emissions from operation-phase activities would exceed the BAAQMD significance threshold of 80 pounds per day for SOx and NOx, an ozone precursor.	S	S	4-AIR-2: Diesel engines shall meet BAAQMD standards and shall be properly maintained and regularly tuned according to the manufacturers' specifications to ensure efficient operation.	SU
J. NOISE				
4-NOISE-1: Equipment, vehicles, and activities during grading and construction would increase noise levels temporarily in the DoD Housing Area.	LS	LS	4-NOISE-1: <ul style="list-style-type: none"><li>Muffle and shield all intake and exhaust ports on power construction equipment, and shroud or shield all impact tools.</li><li>Where such equipment is available and feasible, use electric, rather than gas or diesel construction equipment.</li></ul>	LS
4-NOISE-2: Equipment, vehicles, and activities during operation would increase noise levels for area residents and recreationists.	S	S	4-NOISE-2: <ul style="list-style-type: none"><li>The Project shall not cause noise levels in adjacent residential areas to exceed 65 dBA (Ldn). Noise levels shall be monitored at appropriate locations to confirm compliance with this requirement. If noise levels are exceeded, equipment and/or operations shall be modified as necessary to achieve compliance.</li><li>Install "critical" grade silencers and enclose each pump.</li><li>An acoustical engineer shall develop a noise reduction plan to minimize pump levels below regulatory standards.</li></ul>	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
K. RECREATION				
No recreational areas would be affected by wetlands restoration on the Hamilton site.				
L. POPULATION, HOUSING AND EMPLOYMENT				
Wetlands conversion of the Hamilton site would not have a significant impact on housing, population or employment.				
M. VISUAL RESOURCES				
4-VIS-1: The off-loading and pumping facilities in the Bay would have a minor visual impact on views from the shoreline and from the Bay.	LS	LS	4-VIS-1: Improvements shall be designed to blend with the surroundings as much as possible. A paint scheme and design shall be developed for the pumping facilities, the off-loading suction pipe, fuel storage tank, and ancillary buildings which are compatible with the Bay setting.	LS
4-VIS-2: Contrary to BCDC policy, new electric distribution and telephone lines are proposed to be placed above ground, resulting in an adverse impact on visual resources. Lines would be at least 6 feet apart to lessen impacts on birds.	S	LS	No mitigation is suggested.	LS
4-VIS-3: The off-loading facility would require night lighting during periods of 24-hour operation.	LS	LS	4-VIS-3: All night lighting shall be designed to direct light onto work areas and to prevent unnecessary direct exposure of lights to adjacent areas.	LS
N. UTILITIES AND PUBLIC SERVICES				
4-UTIL-1: New electric distribution and telephone lines are proposed to be placed above ground, contrary to BCDC policy, potentially adversely affecting wildlife habitat and visual resources. Lines would be at least 6 feet apart to lessen impacts on birds.	S	LS	No mitigation is suggested.	LS

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Table 3-5  
SUMMARY OF IMPACTS AND MITIGATION MEASURES  
Alternative 4: Hamilton Site  
(continued)

Impacts	Significance Prior to Mitigation		Mitigation Measures	Significance After Mitigation
	County	Corps		
N. UTILITIES AND PUBLIC SERVICES				
4-UTIL-2: Implementation of this alternative could restrict access to the NSD dechlorination station.	LS	LS	4-UTIL-2: The Applicant shall grant the NSD a perpetual easement across the airfield for access to the dechlorination station. NSD access shall be ensured through continual maintenance and operation of pumps and levees.	LS
4-UTIL-3: Implementation of this alternative would result in the loss of Hamilton Field as an emergency landing strip.	LS	LS	4-UTIL-3: Gnos Field airstrip in northern Marin County shall be designated as an emergency landing strip. Alternately, another Bay Area airstrip could be designated for emergency landings.	LS
O. ECONOMIC AND FISCAL FACTORS				
4-ECON-1: This alternative would significantly increase disposal capacity for dredged materials, which would help maintain navigation channels, indirectly maintaining or increasing port-related economic activity and adding local income in the City of Novato.	NA	S	No mitigation required for a beneficial impact.	NA
4-ECON-2: This alternative would result in an operating surplus for the City of Novato.	NA	LS	No mitigation required for a beneficial impact.	NA
4-ECON-3: If the project fails prior to its proposed completion, remediation and restoration of the site to pre-Project conditions, or continued maintenance and operation, would be required. This could be a significant impact on City financial resources.	S	S	4-ECON-3: The Project Applicant shall be required to post bonds in an amount sufficient to perform remediation and restoration, or ongoing maintenance and operation.	LS
4-ECON-4: If restored wetlands are donated to a public or non-profit entity at the end of the project's life, there would be an unspecified cost to this entity (or to the City of Novato if such an arrangement failed) associated with long-term management and maintenance of the project site.	LS	LS	4-ECON-4: The City of Novato shall require that the Applicant establish a self-supporting fund to reimburse any public or non-profit entity that takes over the site and provides long-term management and maintenance.	LS

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